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Heavy Fly Wheels and Grist Mills.

While some correspondents have written to us stating that heavy fly wheels were positively necessary to prevent backlash and to produce equable motion in flouring mills, Messrs. Hatfield & Smith, of Cuyahoga Falls, Ohio, inform us by letter, that after several years' experience, they have formed the opinion that "a heavy fly weeel is but a poor remedy for a badly constructed steam engine." They assert that if a steam engine is properly proportioned, with the valve arranged for the work it has to perform, it will run well with a light fly wheel. The performances of the mill engine described on page 208 (whereby ten bushels of wheat were ground to each bushel of fuel consumed), they consider good. They (H. & S.) have put up an engine of 12-inch bore cylinder, 24-inch stroke, boiler 26 feet long, 42 inches in diameter, with two 16-inch flues, set in brick arch, which turns out sixty barrels of flour in twelve hours running, using thirty bushels of slack or dross coal, which only costs one dollar per tun in that place. This mill belongs to Mr. Thayer. of Akron, Ohio. If we allow four bushels of wheat for each barrel of flour made, no less than eight bushels of wheat are ground to each bushel of slack consumed. This is doing good work certainly. They have also put up quite a number of engines of the same character for other parties, both for grinding grain and sawing wood, in which coal, wood and sawdust are employed for fuel, and with the same satisfaction as to results. They gear their engines for the piston to travel at the rate of *five hundred* feet per minute; cut off steam at half stroke, and use a single slide valve.

A Good Sign.

The editor of *Hall's Journal of Health*, an excellent monthly, published in this city, says:—

"In passing through the city, or entering houses for the first time, we find ourselves deciding upon the character of the inmates from the newspapers we see at the door, and the periodicals lying about; and we feel a guarantee that there is refinement and elevation within when we see the *Home Journal*, SCIENTIFIC AMERICAN, *Musical World*, *Littell's Living Age*, and publications of that stamp. These four might be profitably taken by every family in New York, and ought to be taken in thousands where they are not; for they are always chaste, always instructive; nothing in them to blunt the moral sense, or offend our religious sentiment. In these, and some *one* good religious newspaper, there is as much reading of this sort as the generality of our households can profitably indulge in."

THE next meeting of the American Association for the Advancement of Science will be held at Baltimore, Md., on the last Wednesday of this month (April).

JAY'S MORTISING AND BORING MACHINE.

Fig. 1

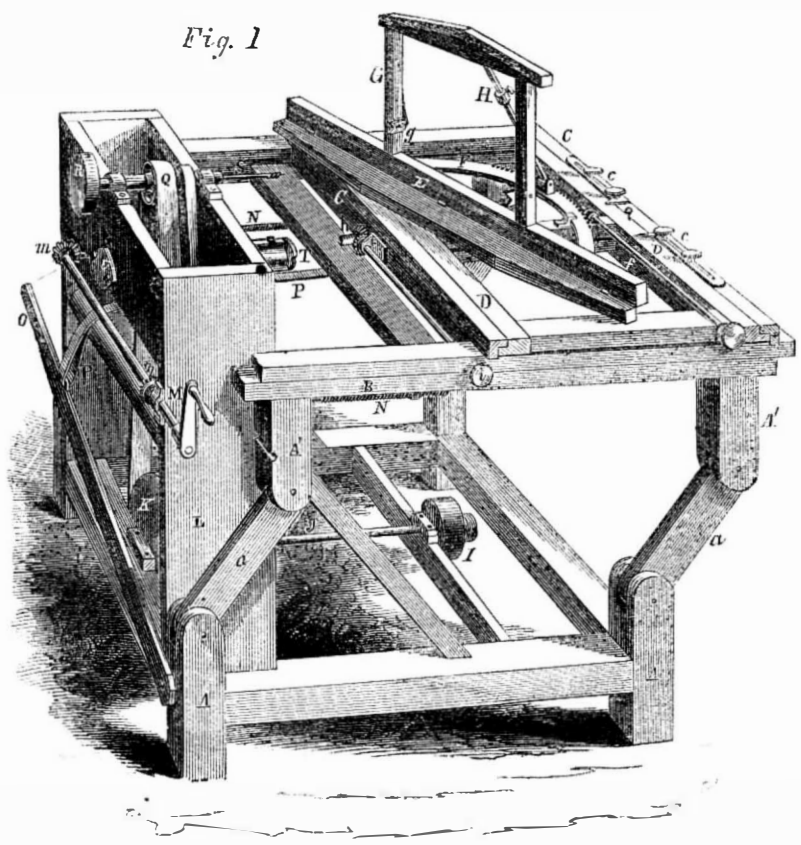


Fig. 2

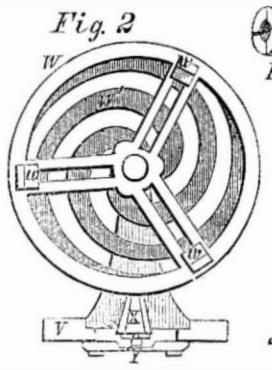


Fig. 6

Fig. 3

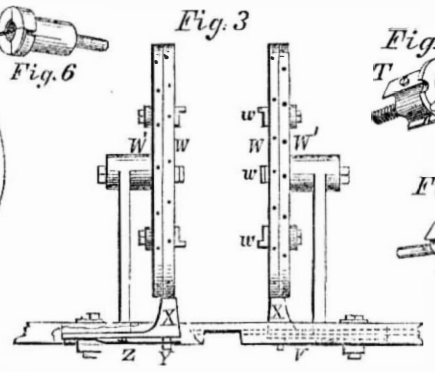
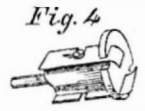


Fig. 5

Fig. 4



The number of machines which will perform many operations, and combine within the limits of a compact frame, appliances which render them useful for a multitude of purposes, are daily becoming more numerous. Amongst the most prominent of these is the machine we are about to describe, which is the invention of J. M. Jay, of Canton, Ohio, and was patented by him July 28, 1857.

Of our engravings we will describe first the perspective view, Fig. 1. A are four legs bound together in a frame, and having hinged to them links, *a*, which are again hinged to the legs, A′, of a supplemental frame. To B are secured cross slides, C, one of them having two small sliding stops, *c*, upon it. In these slides there moves the frame, D, carrying a frame, E, provided with a cogged arc, F, so that it can be set at any angle by the rod and worm wheel, *f*. G is an upright stand for holding stuff, and being provided with two spring-fastened angular catches, *g*, and so arranged that it can be placed at any angle by means of the sliding bar and screw, H. There is a small stop screw which regulates the depth of the mortise, seen at *h*, and operated by the milled head, *i*. The frame, B, can slide to and from the tool on A′, and it is generally held back by two spiral springs, not shown in the engraving.

I is a band wheel on a shaft, J, that receives the power, and gives motion to K placed in a vertical frame, L; this frame, L, also carrying a shaft, M, that has two bevel wheels, *m m*, upon it, by turning which, the screws, N, are rotated, and the frame, A′, raised or lowered to the tool. O is a lever, having a band, P, attached to it, the other end of which is connected with the back of B, so that by depressing O, the frame and contained stuff is brought against the tool. Q is a band, which passes over one tool arbor that has a wheel, R, on one end, so that the machine can be driven by hand, and a tool, S, in a recess in its other end. The belt, Q, communicates with K, and derives its motion from it. T is a tool in an arbor below, that is operated by Q and also rotated by it. This lower arbor is placed in a sliding frame, U, so that it can be lifted up or down, and adjusted in the most desirable position. The stuff to be mortised is placed on the frame, E, at any desired angle, and by means of a pin in D, catching against the stops, *c*, the length of the mortise is determined. The two notched plates, *g*, are used in boring round stuff, and in fastening a chair pillar, when you wish to mortise one; the extra arbor cuts tenons of any thickness, by simply raising or lowering it.

Fig. 6 is a hollow auger for cutting round tenons. Fig. 4 is a tool for turning chair backs, and Fig. 5 smoothens or cuts any stuff.

There is an almost endless variety to the tools that can be employed in this machine, for the various purposes to which it can be applied. For the purpose of turning carriage hubs, the frame, D, has to be removed, and the face plates, W, (of which Fig. 2 is a front, and Fig. 3 a side view,) on the pieces, V, put in its place. These face plates are each composed of two pieces, W and W′; W having three slots, direct from the center to the edge, and straight, and W′ having spiral slots, from the center to the edge; in these slots work slides or catches, *w*, so that by turning W′ they will firmly grasp the hub, and a spring catch, X, fitting into the holes on the rim of the face plates, holds it secure while being shaped. Z is the spring of one of these catches, part of V being broken away.

This is a most convenient and compact machine. Any more information concerning it can be obtained by addressing the inventor as above.

Steam Squirrel Hunting.

A correspondent writing from Stockton, Cal., informs us that ground squirrels are so numerous in that region that they are a perfect pest to the farmers, as they destroy a very large portion of their crops. As much as $100,000 are expended annually in California in purchasing strychnine, arsenic, and phosphorus, to destroy them, but these poisons seem to produce no useful result in diminishing their numbers. Our correspondent, however, has, we think, hit upon a plan, which, when he carries it out, will put them to route most effectually. He proposes to get a steam boiler of about four-horse power, mount it on a wagon, draw it out to the fields, get up steam, and conduct it into their holes by a pipe, and thus steam the "varmints" in their dens. These squirrels live in what are called "towns;" their holes are very numerous, and in clusters, and the passages underneath are all connected. By taking the steam pipe, therefore, and inserting it in a hole, then closing all the others in the vicinity, and letting on the steam, a whole community will thus be steamed at one operation. When this is accomplished, he will proceed to the next township, and extinguish its subterranean inhabitants in the same manner, and so on until the whole of squirreldom in that region is subdued by the all-conquering power of steam.

Discovery in Electricity.

Dr. C. G. Page, of Washington, D. C., has discovered that positive electricity will extinguish the flame of a lamp, and negative electricity will increase it. When the flame of about two inches hight is charged positively, from a powerful machine, it is rapidly shortened to total extinction. When the flame is charged negatively, it is immediately enlarged, a portion of it being impelled down around the wick tube for the distance of an inch, and a portion also elongated above. This discovery, it is thought, may serve to throw some light upon the many unsolved caprices of lightning.

[The above is taken from the New York *Evening Post*, but we have also seen it in several other papers. Supposing the discovery to be true, we would really like to know what light it can throw upon "the many unsolved caprices of lightning."—EDS.

The blasting necessary to obtain material for the construction of the harbor of refuge at Holyhead, North Wales, still continues; and on one occasion 200,000 tuns of rock were blasted at once by 21,500 lbs. of gunpowder.

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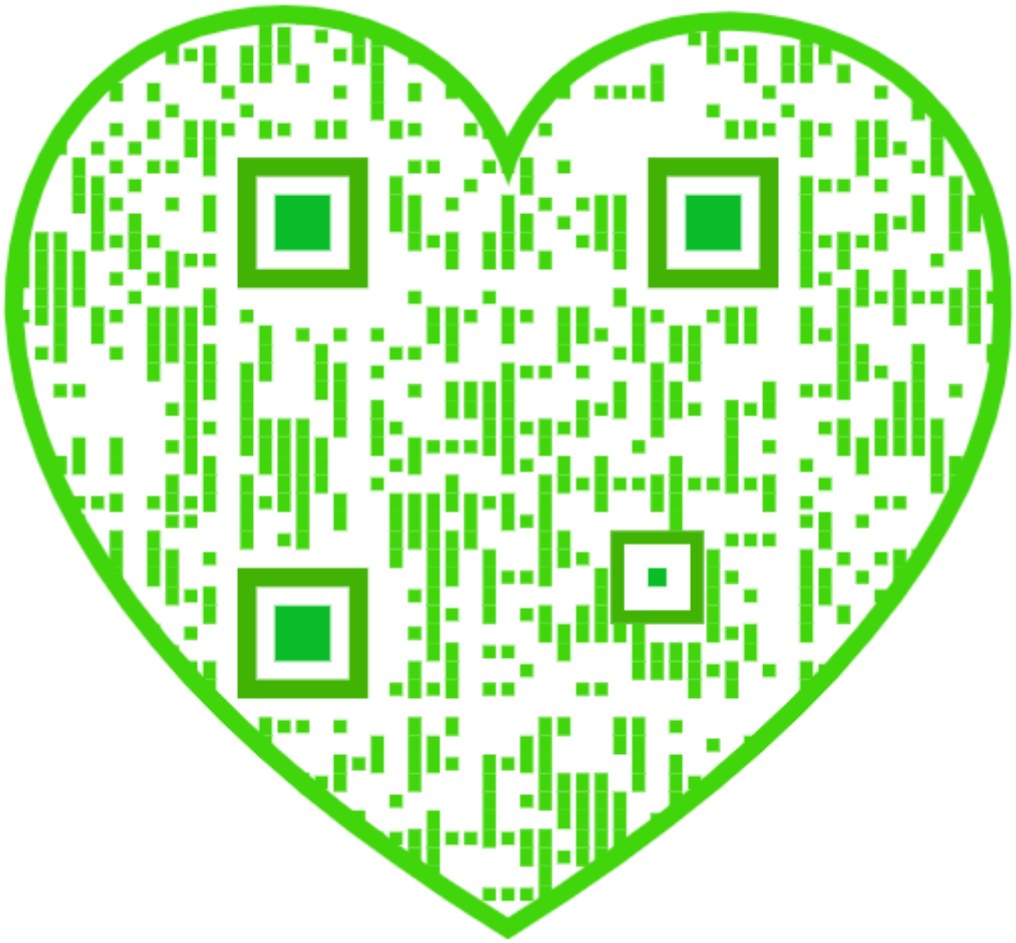

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 23, 1858.

[*Reported officially for the Scientific American.*]

PUMPS—J. B. Atwater, of Brooklyn, N. Y. : I claim the arrangement of the plunger, E, and cylinder, A, with their respective enlarged portions, c d, constructed and operating as and for the purpose set forth.

[This is an arrangement of the plunger and other parts of the pump, so that the water as it is raised and pumped up, is made to act as an efficient packing, and the pump is thereby rendered extremely simple and durable, and susceptible of being operated by a very small expenditure of power.]

PRINTING PRESS—Henry A. Bills, of West Winsted, Conn., and Stephen W. Wood, of Cornwall, N. Y. Patented in England, Jan. 28, 1858. We claim, first, Setting a form of type upon flat rotating forms or beds in separate and independent columns arranged alternately upon the peripheries of cylinders, with corresponding cylinders upon whose peripheries are segments of impression cylinders, the whole arranged substantially as described.

Second, Grooving or notching types, and keying them by independent keys to a bed or form in the manner and for the purpose substantially as set forth.

SELF-ADJUSTING DOOR SILL—Geo. C. Bigelow, of Worcester, Mass. : I am aware that strips have been arranged in and on doors, to close the space between the door and sills, and that strips have been used in windows, that were forced out by springs behind them. These I do not claim.

But I claim constructing a movable door sill that shall be level or even with the floor when the door is opened, and when it is closed shall be raised to form a close fit to the bottom of the door, by means of the spring levers, substantially as set forth and described.

WALKING STICK GUN—Robert R. Beckwith, of New York City : I claim the combination of the hammer, E, pin, C, sleeve, F, and the locking lever, I, as and for the purposes set forth.

[See a description in another portion of this paper.]

RAILROAD RAILS—Leverett Ball, of Auburn, N. Y. : I claim the use of plates, inserted at the middle and ends of the sections of compound rails in combination with said sections locked together throughout their whole length, thus binding the rail together like a solid continuous rail, the whole being constructed and arranged substantially as set forth for the purposes specified.

SECURING THE WHEELS OF CARRIAGES, &c.—Adolphus Bruns, of Davenport, Iowa : I hereby disclaim being the inventor of wheels with independent axles or of revolving axles running upon friction rollers, they having been heretofore used.

But I claim securing the wheels upon the independent revolving axles, in the manner set forth.

CASTING METALLIC CHEESE HOOPS—Timothy Brown, of Georgetown, N. Y. : I claim the combination of the cylindrical guiding and supporting mold-piece, A, provided with the flange bottom, a, and side projections, b b, the semi-cylindrical mold-piece, B, and the guide top, C, all arranged in relation to each other as described, and united by the rods, c and d, substantially in the manner and for the purpose specified.

SELF-ADJUSTING DAMPER FOR HOT AIR FURNACES—Ebenezer Barrows, Jr., of Brooklyn, N. Y. ; I do not claim broadly the employment or use of valves or dampers placed in the hot air conducting pipes of air-heating furnaces, for they have been used for similar or analogous purposes.

But I claim placing the valve or damper, F, in the lower part of the hot air conducting pipe, C, when said valve is so hung or arranged to operate as and for the purpose shown and described.

[A notice of this will be found on another page.]

COTTON GINS—H. W. Brown, of Millsville, N. J. : I am aware that a roller and vibrating and stationary plates have been previously used for ginning cotton, but arranged in a manner different to that shown ; so far as I am aware, no provision has been made for the ready discharge of the seed from the cotton ; I therefore do not claim, broadly, a roller, B, vibrating plate, L, and pressure plate, R, irrespective of the arrangement and connection with the parts shown, as these are seen in the patent of Fones McCarthy, dated July 3, 1840.

But I claim the roller, B, stripping plate, L, and pressure plate, R, arranged as described, in combination with the yielding or vibrating feed board or plate, W, provided with the rods, o, the rods, n, and doffer, N, the whole being arranged to operate conjointly as and for the purpose set forth.

[This is described on another page.]

OSCILLATING PUMPS—Ezra Cope and J. W. Bragg, of Cincinnati, Ohio : We do not claim the movement, nor the arrangement of any part of our pump separately considered.

But we claim the described arrangement of two single acting oscillating plunger pumps to oscillate upon a single trunnion, placed between them as shown, in combination with the employment and use of two or more induction ports in the one chamber of the trunnion, and two or more eduction ports in the other chamber of the trunnion, arranged to alternately communicate with corresponding ports or openings and passages in each cylinder, substantially as and for the purposes set forth in the specification.

MEAT CHOPPERS—Plumer H. Chesley, of Lynn, Mass. : I claim the arrangement of the cogged wheel, the series of spring cutters and cleaner with each other, operating substa tially in the manner and for the purposes as described.

FIRE-PROOF CEILING—J. B. Cornell, of New York City : I claim my improved method of constructing fire-proof ceilings beneath wooden beams, viz., by suspending combined metallic lath sections beneath the aforesaid beams, and then coating said sections on both sides, substantially as set forth.

HOT AIR FURNACES—John Child, of Elyria, Ohio : I do not claim the gradual heating of air in its approach to the fire chamber of a furnace.

But I claim the arrangement whereby I effect the gradual heating and an active circulation of air by the arran ement of the horizontal prolonged passage, A B and C D, surrounding the fire chamber and the rarifying chambers, E E and F, above the fire chamber, constructed and operating as set forth.

SEWING MACHINES—F. S. Coates, of New York City : I am aware that there are many devices for opening or spreading the loop in single thread sewing machines, therefore I do not claim as new the expansion or spreading the loop in such machines.

But I claim the combination of the spring, 8, with the feed, K, and hook, I, for the purpose of expanding the loop in sewing machines, as set forth.

MODE OF CONNECTING THE SECTIONS OF METALLIC FUNNELS—J. W. Cochran, of New York City : I claim the inclined arms, i, attached to the ends of the sections and cople, h, for securing and connecting the same, substantially as set forth.

METHOD OF CLEANSING GAS GENERATORS—Saunders Coates, of New York City : I claim the mode of clearing the retort by the admission of atmospheric air at the top of said retort, in combination with the draft pipe for carrying off the products of combustion, the whole being arranged in the manner substantially as set forth.

BINDING ATTACHMENT TO REAPERS—A. F. French, of Franklin, Vt., assignor to G. I. Stannard, of St. Albans, Vt. : I claim the revolving rake formed of the curved teeth, b, attached to the shaft, A, the rods, D, curved as shown, so as to form the receptacles, e f, and the elastic strips, k k, connected with the lever frame, F, the above parts being combined and arranged to operate substantially as shown, with or without the rod, or bar, for the purpose set forth.

[A revolving rake is employed in this invention with stationary curved rods, a band holder and band adjuster, so that the grain may be bound by an attendant as rapidly as it is cut by the reaping machine to which the device is attached.]

MACHINE FOR CUTTING THE LEAVES FROM THE SUGAR CANE PREPARATORY TO GRINDING—Calvin Dickey, of Mercersburg, Pa. : I claim the cutting device formed of the cutters, a, attached to a tubular flanch, A, the whole being constructed and arranged so as to operate substantially as and for the purpose set forth.

[We give a notice of this in another column.]

HAYCOCK PROTECTORS—O. R. Dinsmoor, of Auburn, N. H. : I claim combining with the cover, elastic ground connections, and a center pin, C, to extend into but not through the hay, the whole being arranged so as to operate with respect to the haycock, substantially as described, when applied thereto.

REGULATORS FOR ROVING OR YAEN—Daniel Dermond, of Philadelphia, Pa. : I do not claim the controlling of the movement of the heckle chain through the agency of the upper feed roller.

But I claim the combination of the pulley, G, the system of spur gearing, the shaft, A, pulley, B, and enclosed box, C, with the ratchet, a, and position stop, d, the whole arranged, applied and operating substantially as and for the purpose set forth.

[This invention is principally intended to be applied to the jenny for spinning rope yarns, but may be adapted to other machinery for drawing and roving or spinning hemp or other fibrous materials of similar character.]

HOMINY MILLS—F. B. Drake and J. W. Teal, of Indianopolis, Ind. : We claim the combination and arrangement of the perforated disks, D D D D, with the fan, K K, when constructed and arranged substantially in the manner and for the purposes set forth.

SAWING STAVES—H. H. Evarts, of Chicago, Ill. : I claim the arrangement of the machinery as described and shown in the specification and for the purposes set forth.

METALLIC BOATS—Joseph Francis, of New York City. Patented in England July 21, 1856 : I claim preparing sheets or plates of metal for forming boats for corrugations composed of a series of flat or nearly flat surfaces united by a curved or nearly quarter circle corrugation, substantially as and for the purposes specified.

I also claim the manner specified of varying the size and proportions of corrugated metallic boats made from sheets pressed in one size of dye by forming the corrugations near the center parallel or nearly so, and increasing or decreasing the number of central plates, formed with such corrugations, substantially as and for the purposes specified.

WATERTIGHT WASHSTAND—Christian Gees, of New York City : I claim, first, The raised flange, ridge, elevation or projection upon the basin, in combination with the counter sunk marble slab to fit such flange for the purpose set forth.

Second, I claim the cap-like attachment upon the faucet fitting closely over the projection upon the marble slab through which the faucet passes, for the purpose set forth.

ROOFING CEMENT COMPOSITION—Robert Glennon, of New Orleans, La. : I disclaim the compositions patented by R. H. Smith and C. R. Milks, in 1857, as differing from my invention.

What I claim is the composition made up of the ingredients specified, in substantially the proportions and in the manner set forth.

GRINDING ATTACHMENT TO PUG MILLS—D. H. Gage, of Dover, N. H. : I claim the combination of the double series of rotating arms, E E, and F F, with the stationary arms, d d, and the dish-shaped grinder, C, when the said parts are so shaped and arranged as to operate in conjunction with each other, substantially as set forth.

ROTARY STEAM ENGINES—J. B. Groomes, of Carmichael's, Pa. : I make no claim to the radial piston attached to the shaft, as equivalent devices are well known. Neither do I claim the introduction and exit of the steam through the shaft.

But I claim the flanged cylinders, a a, encasing the shaft at its transverse perforations, i c, and packed as described between ihe flanges and the cylinder heads, in combination with the steam channels, e and d, of the shaft, and the induction and eduction pipes, D and E, communicating with the annular spaces between the flanges of the cylinders, the whole operating as set forth.

RIBBON LOOMS—W. J. Horstmann, of Philadelphia, Pa. : I claim the bent rod, K L, M N N', passing between the two headings of the trimmings or fringes and forming a back or edge over which the filling is worked substantially as described.

PUMPS—J. O. Joyce, of Cincinnati, Ohio : I claim the arrangement of the circular chambers having their valves operated as described, with the wedge valve, G, and its inlet and exit openings, the whole being arranged in the manner and for the purpose set forth and explained.

HOLDING BOLT FOR CARPENTER'S BRACKETS, &c.—I claim the spiral pointed dog or pawl as used with the bolt, to hold and secure carpenter's brackets for fasteners to buildings, as set forth.

DYEING YARN PARTI-COLORED—D. B. Kerr, of New York City : I claim the method of arranging yarn in folds or loops of greater or less strength as a figure may require previous to the application of the eye, substantially as set forth.

I also claim the method of folding yarn as above set forth, in combination with the clamping of the same previous to the application of the dye, so as to preserve the integrity of the folds or loops, substantially as set forth.

I also claim the method of parti-coloring yarn by submitting it while clamped in folded loops of greater or less length to the action of the dye, substantially as set forth.

METHOD OF CLAMPING POLYGONAL PIECES IN PLANING MACHINES—J. W. Killam, of East Wilton, N. H. : I claim the triangular piece, I, and the sliding piece, L, and the dog, K, in combination with each other, for the purpose described.

HARVESTERS—J. M. Long, Peter Black, and Robert Allstater, of Hamilton, Ohio : We claim, first, The combination of the lever box, b, guide piece, d, and short axle, a, with nut and screw, constructed, arranged and operating substantially as and for the purpose set forth.

Second, The stay rod, G, in combination with the bar, E, substantially as and for the purposes set forth.

Third, Supporting the rear of the platform by suspension from the stay rod, substantially as and for the purposes described.

COMPOUNDS FOR HARDENING IRON AND STEEL—Chas. Pauvert, of Targe, France : I claim the use of the ingredients described, compounded in the manner specified, for converting iron into steel.

SUPERSTRUCTURE OF RAILWAYS—S. H. Long, U. S. A., of Louisville, Ky. : I claim, first, The combination of grade plates and ribbed sills, as set forth and for the purposes specified.

I also claim bolting the rails to the sill through the grade plates, in such manner as that the expansion and contraction (or creeping as it is termed) of the rails shall not be communicated to the grade plates, which allows said plates to retain their position regardless of the moving of the rails, substantially as stated.

RAILROAD CAR COUPLINGS—H. E. Loane, of Baltimore, Md. : I claim the arrangement and combination of the coupling bar, B, jaws, E E, F F, and holding plate, D, in the open mouthed coupling heads, substantially in the manner and for the purpose specified.

PLOWS—Thomas McConaughy, of Burnsville, Ala : I claim extending the piece, P, to which the point is secured rearward a distance nearly equal to its hight, and giving it increasing lower flanges at bottom, said piece being formed with thick bounding edges, and a thin plate filling the intermediate space, substantially as and for the purposes set forth.

GRAPHOTYPE—John McElheran, of Brooklyn, N. Y. : I claim the method described of producing the mold or matrix, wherein the metal is deposited by electrical action to form picture-types, or their equivalents of wax, applied to and in combination with a hard transparent, smooth and level plate, substantially in the manner set forth.

PRESSES FOR EXTRACTING OIL FROM LINSEED—Chas. Moore, of Trenton, N. J. : I claim the combination of the ground plates, with the hair padding or such other padding as may be used, fastened to the plates of the press, with its edges made thicker than the body of the padding.

I also claim connecting the upper plate to the top of the press by links or staples and pins, and the plates to one another by links and pins, so arranged that the plates may be pressed together without cramping the links by which they are connected.

COTTON BALE TIES—David G. Olmstead, of Vicksburgh, Miss. : I claim the clasp, A, and wedge, C, arranged and operating in combination with the band, B, with its bent extremities, a a, substantially in the manner and for the purpose specified.

MACHINE FOR TURNING TOOL HANDLES, &c.—Hiram Plumb, of Honesdale, Pa. : I do not claim, broadly, and irrespective of the arrangement shown, the employment or use of a pattern in connection with cutters to a carriage, for such device has been previously used for the purpose of turning various articles.

But I claim the employment of roughening-off cutter, K, socket, J, forming cutter, M, pattern, O, finishing cutter, Q, and stops, k, combined and arranged to operate as and for the purpose set forth.

[Full particulars of this invention will be found on another page.]

CEMENT COMPOSITION FOR ROOFING—Bradley L. Prime, of Hamilton, Ohio : I am aware that some of the ingredients used by me have been employed for analogous purposes in various proportions, and in combination with various other substances. Therefore I do not claim, broadly, the employment of such substances in roofing composition.

But I claim the combination of the substances described, in substantially the proportions set forth, for the manufacture of a roofing composition.

STOVE HEATING APPARATUS—David J. Quimby, of Brooklyn, N. Y. : I do not claim the use or construction of the stove, nor combining a heating stove and heater in one apparatus, nor bringing a current of cold air to the heater, to be heated and diffused in the same or another room.

But I claim the arrangement of the heating chamber, B, provided with deflecting plates, D D', and apertures in the top plate with the cold air flue, in connection with the stove or furnace, A, constructed and operating as described.

COTTON PRESSES—Hiram Ross, of Rockport, Ind. : I do not claim, separately, the toggles, E E', for operating the follower, D, for they are a common and well-known device, and have been previously used for similar and analogous purposes.

But I claim the toggles, E E', in combination with the lever, G, provided with the semi-circular projections, I J, and connected with toggles by cords or chains F K, the whole being arranged to operate substantially as and for the purpose set forth.

[This is an improvement on that class of presses in which a progressive power is obtained, and consists in the employment of toggles in connection with a lever, so arranged that the work is performed expeditiously, and with moderate application of power.]

REVOLVING CYLINDER STEAM ENGINES—Thos. Rogers, of Philadelphia, Pa. : I do not claim the arrangement of ports and passages for the induction and eduction of steam.

But I claim the two L-shaped stationary hollow steam heads, C D C' D', applied and arranged substantially as described, to constitute stationary journals for the two hubbed drum or fly wheel, E, and bearings for the cylinder journals, while they also constitute valves for the induction and eduction of the steam, substantially as described.

[We have noticed this invention in another portion of this journal.]

CORN HARVESTERS—Thomas A. Risher, or Circleville, Ohio : I claim the arrangement of the concave shocker, I, clamp lever, J, and rest, k, with relation to cutters, a a, inclined arms, c c c c, belt, H, and guide, i, the whole being constructed and operated in the manner and for the purpose set forth.

CIGAR-LIGHTING CINDERS—Henrich Reemann, of Hartford, Conn. : I claim the cigar-lighting cinders, compounded and formed as described, and for the purpose set forth.

TURNING AND SLIDING TABLES FOR RAILROADS—William Sellers, of Philadelphia, Pa. : I claim interposing the central part or box between the ends of the truss rail beams, in such manner, substantially as described, as to make use of the width of the said central part or box as a portion of the length of the said beams, and the said beams and central box are so constructed and connected as to form a table entirely supported from the central part or box, substantially as described.

STOP-MOTION FOR HAIR CLOTH LOOMS—R. J. Stafford, of Smithfield, R. I. : I wish it to be understood that I do not limit myself to the special construction or arrangement of parts as described.

But I claim all merely formal variations performing the same mode of operation by equivalent means.

What I claim is the mode of operation, substantially as specified, by means of which, in case the hook, nippers, or other instrument used to insert the weft of the cloth, fails to seize and draw in any one hair, or other material intended, a disconnection is in consequence effected between the gear that controls the action of the several sets of heddles, and the source of motion before the relative positions of the several sets of heddles to each other are shifted, and a new set opened, while the other parts of the loom are permitted to continue in operation, substantially as specified.

And I also claim the mode of operation, substantially as specified, by means of which the "signal messenger," (No. 6) during the backward beat of the bay is returned to such a position, and whenever the hair or other material is inserted between the threads of the warp, where it belongs, the geer which controls the action of the several sets of heddles is again put in motion, as set forth.

I also claim the "signal messenger," (No. 6) constructed, applied, and operated in the manner and for the purpose substantially as described.

GAS BURNER—Denis Sullivan and Michael McIntyre, of Cincinnati, Ohio : We claim the construction and arrangement substantially as described, of the plug, C, regulating the flow of gas to any extent desired.

TIGHTENING THE TIRES OF CARRIAGE WHEELS—Robert B. Scott, of Philadelphia, Pa. : Disclaiming the exclusive use of taper keys for drawing together the two ends of the tire.

I claim the end, C, with its slotted lips, a, and the bent end, B, with its slotted enlargement, d, in combination with the taper keys, D and D', and bolt, E, when the two ends are arranged and adapted to each other, substantially in the manner set forth, and for the purpose specified.

PISTONS AND PISTON ROD CONNECTIONS—A. P. Samuel, of New York City : I do not claim generally transmitting motion from a fixed cylinder direct to the crank, without intermediate connections, by means of an oscillating cylinder rod.

But I claim a direct connection of the piston rod to the crank, with a fixed cylinder, by the use, or by the the means of, the arrangement of the movable boxes, G G, in the piston, forming the connection between the piston and piston rod, in combination or connection with the part, d x', moving upon the curved covers of the cylinder, the whole arranged substantially as and for the purposes set forth and specified.

SEWING MACHINES—James and Amos W. Sangster, of Buffalo, N. Y. : We claim the looper, when the several parts thereof are constructed and arranged to operate, in relation to each other, to the needle and thread, substantially as set forth.

POST FOR FIELD FENCES—Heber G. Seekins, of Elyria, Ohio : I claim foot piece, A, having recess, a, and lugs, c c', in combination with the posts, said posts having apertures, d d', and recesses, f f', said apertures and recesses so partitioned as to correspond with aperture a, and lugs, c c', of foot piece, A, in the manner and for the purpose substantially as set forth and described.

PLOWS—Daniel L. Tilton, of Mt. Carmel, Ill. : I claim the construction and arrangement, substantially as described, of the tines, J, operating in the manner and for the purposes explained.

RECIPROCATING AND ROTARY MOTION—Isaac Van Doran, of Somerville, N. J. : I do not claim, generally, changing reciprocating into rotary motion by means of the gearing, B, and rotating wheel, A.

But I claim the arrangement of the wheel, D, and its projection, b, as described, so that the wheel, D, shall be constantly rotated by the use of d and b alone, without springs, sliding cogs, or any other mechanism.

MILL BUSHES—John Wells, of Baltimore, Md. : I disclaim concentric rims, the one secured to the shaft and the other to the stationary portion of the system, as such is not new, and does not constitute my invention.

But I claim the feathered spindle, S, and recessed flanged collar, a, resting upon plate P', in combination with plates, P' and P, the cylindrical guide, C, depending from the latter plate, when said parts are arranged for joint operation substantially as set forth.

MEAT-CUTTING MACHINES—Frederick Wolfersberger, of Salem Station, Ohio : I claim the segment plates arranged spirally on the roller between the pins, in combination with the knives, H, substantially as described.

COMPOSITION FOR VARNISHES—Damon R. Averill, (assignor to himself and James F. Davis,) of Pulaski, N. Y. : I claim the described composition of matter, consisting of water and acetate of lead, with spirits of turpentine and coal tar, for the purpose of making a cheap, quickly-drying, and superior varnish, substantially as set forth.

SHOE PEG MACHINE—Amos H. Boyd, (assignor to Samuel F. Case,) of Saco, Maine : First, I claim the combination of the pointer, splitter, and intermittent feed of the block, operated conjointly, substantially as specified.

Second, The construction and arrangement of the transversely or circumferentially grooved or threaded rollers, as a means of feeding and holding the block or bolt for pointing, substantially as specified.

STEAM GAGES—Franz Burckle, (assignor to Edward H. Ashcroft,) of Boston, Mass. : I do not claim so attaching the piston to an elliptic spring that such piston shall be wholly supported by such spring, either with or without contact of the piston with the sides of the passage, or space within which the piston may move.

Nor do I claim connecting one end only of the piston to the spring.

Nor do I claim supporting one end of a rod by a set of radial bars or toggles, while its other end is supported by a spring, and the rod is carried through a tube, as shown in the drawings of No. 13,917 of United States patents, for in my mode of supporting the piston and keeping it from contact with the sides of the passage through which it extends, the radial disk spring not only performs the function of supporting the elastic diaphragm and centralizing the piston, but that of a spring, to draw the latter downward under any relaxation of the pressure of the steam.

Nor do I claim the employment of a collapsable hollow spring, or combination of concavo-convex springs, and their application to their case or frame, and a pitman, as shown in Grantoff & Albright's gage, as described in the London "Mechanics' Magazine," Vol. 66, page 269, wherein the collapsable spring operates by the lateral contraction on raising the pitman. The upper spring of the piston of my improved gage operates by latitudinal extension in elevating the piston.

But I claim supporting the upper end of the piston by the main spring, H, in combination with supporting the lower end of the said piston by a radial disk spring applied to it and the elastic diaphragm, and operating therewith, substantially as described, the same serving not only to centralize the piston during its movements, or maintain it in a straight path, and out of contact with the sides of the passage through which it plays, but to operate in other respects as set forth.

I also claim fastening the main spring, H, at the middle part of its inferior half with the lower part of the box or case, and making the piston play through the fastening and abut against the upper half of the spring, the same causing the spring, under pressure of the steam against the diaphragm, to operate by latitudinal extension rather than by contraction, and securing advantages as set forth.

SEWING MACHINES—David W. Clark, of Bridgeport, Conn., (assignor to H. L. Clark, of Fairfield, Conn.) : I claim first, The employment of an adjustable guide, N, constructed and arranged substantially as described, for the purpose of guiding the needle, J, and its thread, stripping the loop of needle, C, and placing the loop of needle, J.

Second, The combination of spring, O, with guide, N, for holding the needle, J, within the groove of the guide, substantially as described.

Third, The employment of a swinging plate, P, serving as a loop stop for both stitches.

CREAM FREEZERS—Enoch S. Farson, (assignor to himself and Henry H. Brown,) of Philadelphia, Pa. : I claim the concave beater, p, in combination with a scraper, q, and an oscillating horizontally-placed cream cylinder, B, the same being arranged so as to operate together in the manner and for the purpose set forth and described.

RAILROAD CAR BRAKES—Daniel H. Feger, (assignor to himself and Mahlon M. Wombaugh,) of Cincinnati, Ohio : I claim the arrangement of the friction pulley, J, concentrically on the front axle, D, of the truck, and combining the same with the brake, E E, and with the sliding buffer or pulling bar, N, by means of the pivoted vertical spring friction block, K, pivoted horizontal rising and falling shoulder bar, O Z Z, and transverse pins, P P, said parts being arranged relatively to each other, and operating in conjunction, substantially as and for the purposes set forth.

KNITTING MACHINES—Joseph Vickerstaff, (assignor to Martin Londenberger,) of Philadelphia, Pa. : I claim imparting to two sets of thread guides the continuous vibratory movement, combined with the transposing movement described, by means of the cam wheel, L, acting in conjunction with the lever, K, and arms, p and p', or equivalent devices, for the purpose specified.

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BELT COUPLING—Samuel Green, of Grand Rapids, Mich., (assignor to Silas B. Green, of Rochester, N. Y.): I claim the plate or stock, C, slotted and provided with tongues, D, one or more, corrugated at one edge, and provided with spurs, g, the whole being constructed, arranged, and applied to the ends, A B, of the belt, so as to act substantially as and for the purpose set forth.

[This invention consists of a metal plate or stock of oblong form, equal in length to the width of the belt to which it is applied, and firmly riveted to one end of the belt parallel with its edge. This plate or stock has one or more slots in it, in which slots tongues corrugated or grooved at one edge, and provided withspurs, are fitted. The opposite end of the belt is passed through the slot or slots in the plate or stocks, and, owing to its relative position with the tongues and plate, is firmly secured therein by the tension of the belt, and the two ends of the same are, consequently, firmly connected.]

TRACKS FOR CITY RAILWAYS—E. S. Gardner, (assignor to himself and John H. Gould,) of Philadelphia, Pa.: Disclaiming the exclusive use of a continuous tube with a slot on the top, as a device employed in atmospheric railways.

I claim forming between the rails of a city railroad track, an underground tunnel, and hanging a series of pulleys within the same, said tunnel having a longitudinal slot near the level of the ground, and being otherwise so arranged that a rope may be used for drawing the cars along the track, without impeding the passage of the vehicles across the same.

SHIP'S BULKHEAD—Charles Maliphant, (assignor to Thomas West,) of New York City: I claim the arrangement of two or more thicknesses of crossed planking, the interposed felt, or other equivalent material, and the stanchions with each other, substantially as specified, and for the purpose set forth.

EGG-BEATER—Patrick Mihan, (assignor to himself and G. Davis,) of Boston, Mass.: I claim the beating apparatus, constructed and operating substantially as described, in combination with the portable plate or cover A, so that it may be either held in the operator's hand, or placed on the top of a vessel.

REVOLVING FIREARM—F. D. Newbury, (assignor to R. V. DeWitt, Jr.,) of Albany, N. Y.: I claim the lever, L, formed and fitted as described, for the purpose of cocking the hammer, holding the same when it has been cocked by hand, rotating the cylinder, and holding the cylinder firmly in the act of firing.

I also claim the hammer, with its pin, b, in combination with lever, I, for cocking by hand. The combination of hammer, lever, ratchet wheel, and trigger, arranged substantially and for the purposes set forth.

RAILROAD CAR AXLE BOXES—R. N. Allen, of Cleveland, Ohio: I claim, first, The self-adjusting collar or washer, F, in combination with the slide partition, G, and packing, c, operating in the manner and for the purpose specified.

Second, I claim the box, B, and key, C, provided with articulating surfaces s' s', in combination with the key, D, for the purpose of relieving the axle from strain, and of conveniently removing and replacing the box, B, and collar, F, by simply relieving the axle from strain, without removing it, the whole being constructed and arranged substantially as specified.

RE-ISSUES.

MACHINE FOR MAKING HAT BODIES—William Fasket, of Meriden, Conn. Patented January 23, 1846: I am aware that mechanical pickers of various constructions have been used in connection with pervious surfaces surfaces and exhausting fans, in the manufacture of hat bodies, and therefore do not claim such devices separately, or in their pre-existing combinations, as my inventions.

But I claim the described automatic method of forming hat bodies, having the required variation in thickness at their different parts, by supplying picked fibers to an exhausted former of the size and shape required, in such manner that a larger portion of picked fibers is supplied to that part of the former which corresponds with the thickest portion of the hat body, and a less portion to the other parts of the former, substantially as set forth.

I also claim the combination of a picking apparatus, a hat body former, an air-exhausting apparatus, and a conductor, the whole combined substantially as set forth.

I also claim a bow-string picking apparatus, constructed and operating substantially as set forth, to pick fur presented to it by a suitable feeding and nipping apparatus.

METHOD OF EMPLOYING CENTRIFUGAL FORCE IN CASTING IRON PIPE—Thomas J. Lovegrove, of Baltimore, Md. Patented November 30, 1852: I claim forming pipes, or other castings, by centrifugal force, by causing the mold into which the liquid material is poured, to revolve.

GRAIN SEPARATORS—John R. Moffit, of St. Louis, Mo. Patented November 30, 1852: I claim, first, The endless chains, d, composed of metallic links provided with protuberances or depressions, when used in combination with suitable driving pinions, to impart a positive motion to the straw-carrier of a thrashing or separating machine, as explained.

Second, In combination with a receptacle in which the tailings are deposited by the winnowing apparatus, I claim the arrangement of the screw elevator, o, in relation to the thrashing cylinder, for the purpose of returning the tailing to be re-thrashed, as set forth.

DESIGNS.

COPYING PRESS STAND—Charles H. Clayton, of New York City.

LEGS AND POSTS OF IRON BEDSTEADS—John P. Koch, of New York City.

ADDITIONAL IMPROVEMENT.

CLASPS FOR METALLIC HOOPS—James R. Speer, of Pittsburgh, Pa. Patented December 1, 1858: I claim bending the ends of the clasp across the apertures, b and c, so as to present an opening in the clasp for the insertion of the bent ends of the bands, at right angles, or nearly so, to the direction in which the bands are inserted in the clasp, in the manner and for the purposes described.

Lake Superior Iron.

Some very successful experiments have been made with Lake Superior iron ore, and marble as a flux, by which very excellent iron has been made by S. R. Gay, as we learn by the *Lake Superior Journal*. The experiments were made at Marquette, 411 charges being tried in a small furnace to test the flux, as it was supposed by many that it would not answer, but the iron was of a superior quality, and as the ore is plenty in that region, a great increase in the manufacture of the metal is anticipated. As marble is a carbonate of lime, there can be no doubt but it may be used for a flux in smelting where the common limestone cannot be obtained. For this purpose it should be reduced to very small pieces or to powder.

Ventilating Mines.

The thorough ventilation of our coal and other deep mines is a question of much importance, and is becoming more so every day, as our mining operations are extending very rapidly. In older countries, especially England, where deep mining has been carried on for a great number of years, on a very extensive scale, it would naturally be inferred that the utmost perfection in ventilating agencies would have been reached long before this period, but such has not been the case. It is only within the past two or three years that the greatest improvement yet suggested in ventilating mines has been carried out in that country. This consists in the employment of positive machinery for the purpose, which has been erected at the Abercarn collieries. It consists of a rotary fan driven by a small non-condensing steam engine; and it has been constantly at work, day and night, for more than two years, without once being stopped for repairs. The common method of ventilating fiery mines heretofore practiced, has been by a large fire kept burning at the bottom of an up-shaft, at such a distance from the main shaft that the air rushing down the latter to feed the fire, passed through all the workings, and then escaped in a rarified column through the up-shaft. This method is rude and inefficient, affording no remedy for an increase of air, except by enlarging the fire, and *it* is rendered useless by being extinguished when an explosion takes place—just at the very time when a greater quantity of fresh air is most urgently required.

The rotary fan at the Abercarn colliery was put up by the ingenious James Nasmyth, the inventor of the steam hammer; it is 13½ feet in diameter, has eight vanes, made of plate iron, each 3 feet 6 inches wide, and 3 feet long, fitted on a horizontal shaft. It is enclosed in a plate iron case, with large openings at the center, and trunks for discharging, something like our blowers for furnaces; but it exhausts from the mine, thus causing the fresh air to rush down the main shaft, and pass through the workings to the up-shaft. The mine is 300 yards deep, has seven miles of railroad in it, and fourteen miles of working courses. About 3,000 tuns of materials—coal, iron ore, and fire clay—are raised from it weekly. The fan is driven at the rate of 60 revolutions per minute, and draws 45,000 cubic feet of air through the mine in that period. This quantity supplies an abundance of air for the miners; their health has been greatly improved, and they can now labor during a greater number of hours daily.

When an explosion takes place in a coal mine, the greatest danger of immediate suffocation to the workmen, arises, not so much by inhaling carbonic acid gas, as some have supposed, as by the lungs becoming clogged by inhaling fine flaky soot, which generally saturates the atmosphere. To avoid this danger, the miners who are not burned, generally cover their mouths and noses with their handkerchiefs, and lie down, but unless they receive a supply of fresh air very soon, they must perish. An explosion of some extent took place at the Abercarn colliery, since the above ventilating machinery was erected, but the flaky soot and foul air were abstracted, and the fresh air rushed in so rapidly that none of the miners lost their lives. It is believed that but for the rapid and effective action of the ventilating fan on the occasion, every person in the mine would have perished. The velocity of the fan can be augmented or diminished at pleasure; and as the mine is very dangerous, this is necessary, in order to supply an increased quantity of fresh air on a sudden emergency. Our mining companies would do well to pay much attention to this subject.

Laboratory—No. 1.

Atoms.—It is not derogatory to the human mind to say that it can neither comprehend great things nor small. It is a fact, that no man knows what an atom is; that is, an atom of any material in its smallest state of existence. Very few can comprehend the size of the earth we inhabit, or of the sun, or of the planet Jupiter, which immense orbs are but a collection of atoms, and which, after all, are only a few of the countless worlds of the universe. We can conceive the existence of a small particle of marble, or of wood, or of sugar, or paper; but when the mind endeavors to form a conception of the smallest particle of any of these materials, it falters. When again it considers that what appears to be the smallest particle of sugar or of marble can be further divided, and that, in reality, these materials consist of three other atoms of matter united to form one particle or atom of sugar, marble, &c., the idea is perplexing. It is an ascertained fact, that sugar consists of carbon, oxygen, and hydrogen; but the ultimate size of the atoms of any of these elements is beyond the mind's comprehension. Nevertheless, chemists give to atoms of all the elements an ultimatum, and assign to them a definite weight—that is, a weight by comparision of one to another. It is found that when one substance unites with another, it does so always in a definite regular proportion; thus one hundred parts of oxygen always unite with double their weight of sulphur, four times their weight of selenium, and eight times their weight of tellurium, and so on with every other element, sometimes higher in weight, and at others lower, as the case may be; but it never varies for each specific element. Hence, after numerous experiments performed with the greatest care, chemists have fixed an atomic weight to all the elements, which is the proportion with which they combine with each other; though of different weight, yet they are atom to atom.

SEPTIMUS PIESSE.

Difference of Sight and Hearing.

MESSRS. EDITORS—I am rather fond of trying experiments on myself, and in consequence make observations that would, perhaps, occur to few others. I have just made one on which I should like your opinion, and at the same time communicate the fact to your readers. My sight is very good, never by any chance do I use spectacles, and yet for the last fifteen years I have observed that I am long-sighted with my left eye, and short-sighted with my right eye; and I can hear the ticking of a watch at a greater distance with my right ear than with my left. I should like to know if this is a common occurrence.

L. R. BREISACH.

[The reason that one eye or ear is more sensitive than the other, is because each has a separate nerve, and one of these may be constitutionally stronger than the other, or one can be weakened by a bad light on one side, or too much exercise of the one member. As to the commonness of the occurrence, we never heard of the fact observed by direct experiment before; but any of our readers can try for themselves, by holding a watch at gradually increasing distance from each ear, until the ticking cannot be heard, and noting distance each side; a small ink-spot on a sheet of white paper will serve to test the eyes.—EDS.

How to Raise a Fallen Horse.

We have seen it recommended by a gentleman who has had much experience in the matter, that when a horse has fallen from the slippery state of the ground, the readiest method of enabling him to rise is to put an old rug or carpet under his fore feet, and he will be able to get up at once. Many horses are seriously strained by their efforts to rise on slippery ground, and this is most particularly the case with those of high spirit, and frequently those of greatest value are so frightened by the fall that greater injuries to themselves, as well as danger to those in the carriage, ensue from vain efforts to get them up than by the fall. Let the driver leap down at once, and assist the horse to get in position to get up, at the same time placing the rug, carpet, or even an old coat, under his feet.

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims:—

WALKING STICK GUN.—Robert R. Beckwith, of New York city, has invented a new walking stick gun; and although we cannot explain it so as to give any definite idea of it without the aid of drawings, yet we can say that it is very simple, and the mechanism to effect the cocking and letting-off of the hammer to fire the gun, is also of very simple construction.

DAMPER FOR AIR-HEATING FURNACES.—The object of this damper is to prevent the over-heating of air in the hot air conducting pipes of air-heating furnaces, when the register of the pipes is wholly or partially closed. This over-heating of the air in the closed pipes is attended with dangerous consequences, as adjacent woodwork is frequently ignited, and buildings are burned down, which is a great objection against the use of such furnaces for warming buildings, The invention consists in placing in the lower part of each hot air conducting pipe, a valve or damper, hung on an axis in nearly an equilibriated state, so that when the register of the pipes are closed, and the draft through them consequently stopped, the dampers will close by their gravity, and shut off the pipes from the the air-heating chambers, and when the registers are fully, or more or less open, the dampers will be opened to a corresponding degree by the draft. It is the invention of Ebenezer Barrows, Jr., of Brooklyn, N. Y. An engraving of this invention will shortly appear in our columns.

COTTON GIN.—This is an improvement in what is known as the "roller gin," for ginning Sea Island or long staple cotton. The object of the invention is to expedite the process to a very considerable degree, without injuring the staple or fiber. The object is attained by the use of a roller, vibratory stripper, pressure plate, yielding feed-board, and screw, used in connection with doffers. Hiram W. Brown, of Millville, N. J., is the inventor.

CUTTING THE LEAVES FROM SUGAR CANE.—Calvin Dickey, of Mercersburg, Pa., has invented a machine for the above purpose, previous to crushing or grinding the stalks for sugar. The invention consists in having a cutter attached to a tubular flanch, so as to form a hollow cutting cylinder—this cutting device being connected with a grinding or crushing mill in such a way that the stalks of sugar cane will be drawn through it by the rollers of the mill, and the leaves will be cut from the stalks.

MACHINE FOR TURNING TOOL HANDLES.—Hiram Plumb, of Honesdale, Pa., has invented a new machine for the above purpose. It consists in the employment of a series of cutters combined with a pattern and stops, so that the desired articles can be readily turned and cut successively from a bolt or stick, in an expeditious and perfect manner. The invention also consists in a peculiarity of the finishing tool, whereby the articles, as they are finished, are cut off from the bolt, and they present at their ends a smooth and finished appearance.

REVOLVING CYLINDER STEAM ENGINE.—This invention consists principally in two hollow stationary steam heads, applied and arranged to serve as journals for the main drum or fly-wheel of the engine, and bearings for the cylinder journals, while they also serve as valves to effect the eduction and induction of the steam to and from the cylinder. The inventor is Thomas Rogers, of Philadelphia, Pa.

The great iron district of South Wales has suffered from strikes very severely, and at the present time the men are only just coming back to work after a very protracted strike, the cause of which was a reduction of wages. This was a necessary consequence of the late hard times, but we are glad to chronicle the fact that the iron trade throughout the world is again on the improving scale.

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New Inventions.

Rolling Iron and Steel.

A patent has recently been taken out in England for rolling iron and steel by having the axes of the rollers arranged to work at an angle to each other, and, when two or more pairs are used, the succeeding ones are arranged in opposite directions to the axes of the preceding. By these means, the grain of the iron and steel is twisted and crossed more effectually than by having the rollers placed parallel to one another.

Improvement in the Voltaic Pile.

Of all the piles in use, at present, Bunsen's is that most generally adopted, and yet it has two serious inconveniences—it emits nitrous vapors both disagreeable and injurious to the health; and the electric current, which is very strong at the outset, rapidly decreases in intensity. Many liquids, all those, in fact, which are capable of producing oxydation, may be used for the production of electricity, but a solution of bichromate of potash has hitherto been used with advantage instead of nitric acid. Bunsen himself was the first to propose the substitution, which has since been studied by various chemists, especially by Poggendorf, who in 1842 recommended the addition of sulphuric acid to the bichromate, but without obtaining any remarkable improvement; for, although the exhalation of nitrous vapors was avoided, the diminution of intensity was as great as before. Poggendorf showed that this was owing to a deposit of oxyd of chromium, with which the charcoal and zinc of the voltaic couple became rapidly coated in the course of the operation, but he was unable to point out any remedy by which it might be prevented. M. Grenet, a young chemist of Paris, has been more fortunate, and has succeeded in preventing this formation of the oxyd, by the curious expedient of making a strong current of air pass through the pile. This current causes the oxyd of chromium to be re-dissolved in the exciting liquid as soon as it is formed; the elements of the pile remain unencumbered, and the voltaic current retains the same degree of intensity.

M. Grenet's pile consists of plates of zinc and charcoal placed alternately in a frame provided with vertical grooves into which they fit, so that, as usual, the plates are separated from each other by interstices. The zinc plates are all attached to a copper wire acting as a conductor; another conductor of the same material connects together all the plates of charcoal. These conductors are coated with an insulating substance. The frame has a hollow bottom pierced with small holes, corresponding to the interstices, and a lateral tube fixed to this bottom communicates with the nozzle of a ventilator.

The exciting liquid, contained in a metal trough, consists of a saturated solution of bicarbonate of potash, acidulated with about one-hundredth part of sulphuric acid. When the pile is to be used, the frame with the couples which fits into the trough is immersed in the liquid, and the ventilator set agoing. As no deposit is formed, the liquid may be kept a considerable time without it being necessary to renew it, or it may be partially renewed from time to time, the great object to be kept in view being, first, the perfect saturation of the liquid, and secondly, the permanent insufflation of air while the pile is being used.—*Galignani's Messenger.*

Improvement in Building Ships.

A ship, whether of iron or of wood, is made of a framework, which is then covered with plates or planks; and it is evident that the constant motion to which a ship, when at sea, is subject—the vibration that takes place through her whole hull—in a great measure loosens her joints, and opens the seams between the planks (a leak is sprung), the ship is no longer water-tight; and thus many valuable lives, together with much property, are lost.

The improved method of building ships invented by John Reeves, 55 Sands st., Brooklyn, and patented by him January 5, 1858, is intended to overcome this defect, by providing cross braces from the bilge of ships up to between the upper and lower decks.

In our engravings, Fig. 1 shows a ship, D, in a position in which she is often placed by the winds, and the dotted lines, E, show the amount of vibration which she is likely to undergo. If the cross ties or braces be of wood, then they are represented by A, Fig. 1; they are strongly secured by knees, *a*, to the bilge, and between the upper and lower decks, C′ and C. If, however, iron braces are preferred, they can be made and secured as seen in Fig. 2, where B, the brace or cross tie, is attached to the same places by plates strongly bolted, *b*, and these iron cross ties have screws and nuts, *c*, so that they can always be kept perfectly taut. E and F illustrate the vibrations to which the ship is subject on both sides, and it will be easily perceived how such a vibration would start and strain the timbers, and the frame of a ship. When, however, the sides are thus rigidly connected by these cross ties, it is next to impossible for such vibrations and consequent strains to take place, and consequently, the ship is rendered stronger and safer, without in any way deteriorating her sailing qualities. This system of cross ties can be applied in any part of the ship, so as not to interfere with her cargo room or, if a steamer, with her machinery, and so attain the requisite degree of strength without taking up more room. The inventor will give any further particulars, if addressed as above.

REEVE'S IMPROVEMENT IN BUILDING SHIPS.

Fig. 1

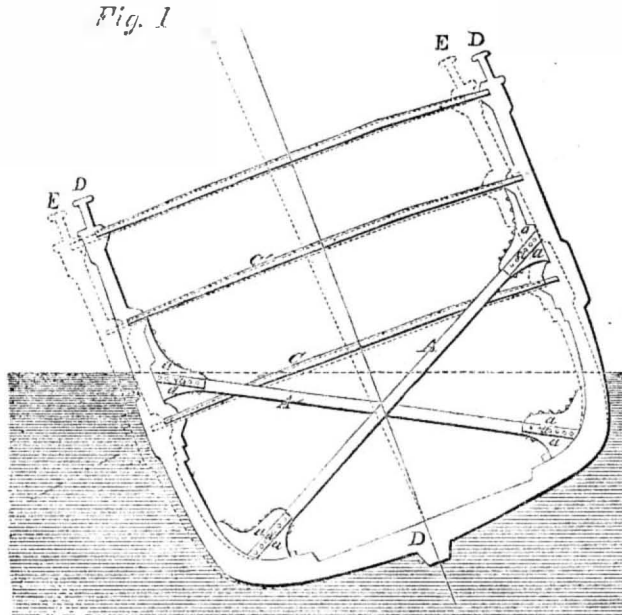
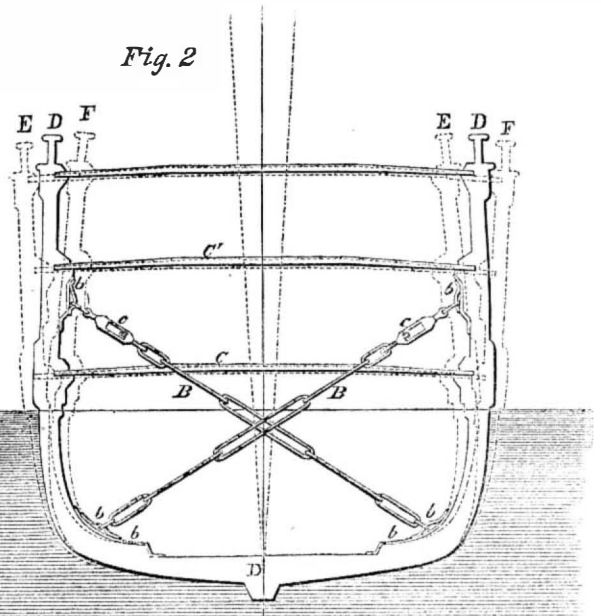


Fig. 2



MOSIER'S CORN PLANTER.

Fig. 1

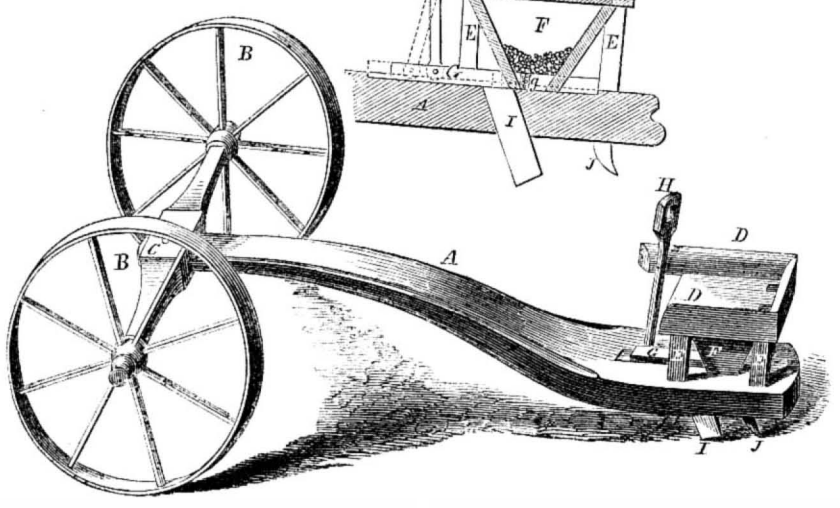
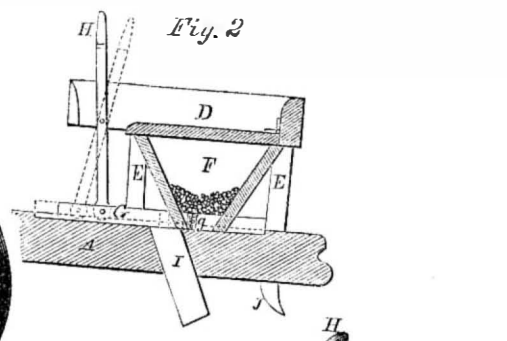


Fig. 2



The great merit of the corn planter which we are about to describe, is its simplicity, and the perfect command which the operator has over it, in all positions and places. It can be drawn by horses or other means, and operated by hand, being light, portable, and constructed with such few parts that there is very little chance of their becoming deranged.

In our engravings, Fig. 1 is a perspective view of the planter, and Fig. 2 is a section through the working parts.

A is a beam, fitting into a slot in a cross piece, C, having a wheel, B, at both ends. The beam can be secured to the cross-piece by a king pin, and the horses can be attached to the cross-piece. On the opposite end of A, (that which rests on the ground,) a seat, D, is raised on four small uprights, E. The seat, D, forms a lid to a seed hopper, F, in the bottom of which slides a piece of wood, G, having a perforation, *g*, that will just contain one deposit of seed, and so acts as a measurer. G is connected by a pin to the hand lever, H, that can move G backwards and forwards. I is the seed tube, passing through A, and J are the coverers. The operation is simple, the operator sitting on the seat, D, having first filled the hopper, his weight causes the seed tube to sink in the earth to the required depth, and from its shape it cuts a trench as it is drawn along. The operator next taking hold of H, pulls it towards him, thus bringing G with the quantity of seed in *g*, directly over I, through which it drops into the earth, and is covered up by J; then pushing H away, *g* is again filled from the hopper, and so the operation continues. The seeds can be planted any distance apart, just when and where the operator pleases, and altogether it is a thoroughly useful machine.

Any further particulars can be obtained from the inventor, P. C. Mosier, of Homer, Mich.. It was patented by him on January 26, 1858.

The Patent Office.

A correspondent writing to the Kalamazoo (Mich.) *Gazette*, in alluding to the unprecedented prosperity of the Patent Office, remarks that "this department has been completely renovated since it has been placed under the control of the present Commissioner—the Hon. Mr. Holt. It had long been in a somnolent state. The antiquated examiners were drilled into a routine similar to that so dear to the 'Circumlocution Office' of venerable England; and an ingenious applicant for its favors fared very much like our simple friend, Mr. Doyce. Mr. Holt is fast bringing the Patent Office up to the requisitions of this progressive age, and a bill has already been introduced into Congress, containing most important and beneficial amendments to the existing law."

We suppose the treatment of "simple friend Doyce" is on a level with what we have been exposing of late, and which Commissioner Holt is determined to correct in future, if Congress will permit him to do it unmolested. —Eds.

American Lap-Welded Iron.

On page 197, this volume, Scientific American, in an article on the above subject, credit was given to Joseph McCully, of Philadelphia, for the first really successful manufacture of American lap-welded tubes. On page 209, we gave the substance of a letter from a correspondent who stated that John Peace produced the first of such tubes in the establishment of Messrs. Morris, Tasker & Morris, of Philadelphia, in 1850. J. D. Heppard, of the *New York Daily Times*, informs us that Joseph McCully sent a model of his machinery—the same in substance as that now employed by Messrs. Morris, Tasker & Co.—to the Patent Office in 1846, three years before Mr. Peace came to this country. He also informs us that although Mr. McCully did not construct and put his machinery in operation until 1852, yet he took means, as far as he was able, to secure a patent, and has never relinquished his title to the invention

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Scientific American.

NEW YORK, APRIL 3, 1858.

Congress and the Patent Office Reports.

For the past fifteen years, Congress has been in the habit of publishing annual reports of the proceedings and business transacted at the Patent Office. As this department has increased in usefulness, the reports have increased in size and interest; and from a meager little volume, they have gradually swelled to three volumes of what are called the "mechanical reports," which contain the claims of every patent issued and a short description of the machine, accompanied with suitable engravings to illustrate it, together with another volume, devoted entirely to agriculture. Of the many reports and collaborations published by our government, the mechanical reports of the Patent Office are the most valuable and interesting, for they contain a fund of information that cannot be obtained elsewhere. The "agricultural report" is, we think, an almost unnecessary book; it contains little original matter, and every subject there mentioned, generally speaking, has been quite as well treated in the numerous agricultural journals of the country.

It has been the habit of Congress to annually print several thousand extra copies of these useful reports, and give them to the Senators for distribution among their constituents; but this year, the Chairman of the Committee on Printing, (Mr. Johnson,) with a false idea of economy, proposes to save thirty thousand dollars by printing only a greatly reduced number of copies, and giving them principally to Senators for distribution, and thus cutting off the hitherto generous supply furnished to the Commissioner of Patents, who knows better how to dispose of them than any other functionary. Mr. Johnson gives what at first seem to be many excellent reasons for this retrograde step, but really all resolve themselves into a fact long established and well-known, namely, that the copies are not distributed amongt he right persons; and Senators do not take that amount of interest which they should in the distribution of the books given to them for that purpose.

We think that if Congress will leave the mechanical division alone, and retrench on the agricultural, the country will be better served. On the motion of Mr. Wilson, it was decided to restrict the Commissioner to a report of one volume of eight hundred pages—engravings and all. This is indeed a wholesale slaughter! The report for 1856 consisted of seventeen hundred and fifty pages; yet the Senators, in their wisdom, expect the report for 1857, of which there is as much, or more, to be compressed into one thousand pages less. Notwithstanding that the honorable gentlemen who form the committee cannot appreciate much that is in a Patent Office Report, yet all inventors know the value of them. The Commissioner's report is already written—part of it has appeared in our columns—and to cut it down would be an act of barbarism.

This matter had better be reconsidered; and when the subject comes before the House, we hope that some member will be found to lay the matter calmly and firmly before that body. Inventors at the present time sadly want a champion in Congress, and the advent of such a hero we should gladly hail; perhaps the present occasion may call one out—we hope so. At any rate, we would ask the Senators and Representatives to be well posted in the pro's and con's of the case, and coolly weigh its merits and demerits before they decide on so important a subject.

If we consulted only our own personal interest in this matter, we should be glad to have the most narrow views upon this subject prevail. It would aid the circulation of the SCIENTIFIC AMERICAN very materially if inventors and patentees were obliged to look into its columns as the only source of information about patent claims; but we take no such narrow, selfish view of the matter; and while we condemn everything which appears like needless expense in the affairs of the nation, we cannot advocate this particular mode of retrenchment.

The Patent Office Reports have become exceedingly valuable; they constitute a history of invention from year to year, and supply a want which no weekly journal could meet.

Cochineal Cultivation in Teneriffe.

The brilliant carmine of the painter, and the rich scarlet and crimson colors of the silk and woolen dyer, are produced from a small bug which feeds on the cactus plant. This insect, called "cochineal," was unknown in Europe before the discovery of this continent. It was first exported by the Spaniards from Mexico, where it was employed by the natives in producing those beautiful red colors on feathers, which were made into divers curious Indian fabrics. Cochineal is sold at from one dollar and a half to two dollars per pound. At one period, its cultivation was mostly limited to Mexico proper, but it has lately been extended to other countries, with very profitable returns to those who have engaged in it. Its introduction and present extensive cultivation in the island of Teneriffe forms a remarkable episode in the history of the plants and people of that wonderful island, whose volcanic peak is seen from afar on the ocean, towering up, like a huge sugar-loaf, twelve thousand feet into the blue vault above. For three hundred years this island had been a vine-producing country, and wine was the principal article of its commerce—as much as 25,000 pipes being exported annually; and who would have thought that it ever would be otherwise? But sometimes revolutions take place in the natural, as well as the social world, and about fifteen years ago, "the handwriting of doom" went forth against the wines of Teneriffe. The "vine disease" fell upon the vineyards, the fruit withered, the plants died, and starvation stared the people in the face. The American vessels which used to frequent the island to exchange flour and provisions for wine, deserted the harbors. What were the people to do?

Some years previous (in 1835) a native gentleman, knowing that the cochineal was cultivated profitably in Honduras, thought it might be equally so in Teneriffe. He therefore introduced the cactus plant and its attendant insect, and set out a cochineal plantation. The people around him, blinded by a strange fanaticism, thought that the cultivation of the cactus was something insulting to the vine, and they destroyed his plantation at night. But being a man of some determination, and supported, happily, in his views by government, he was so encouraged as to adhere in his efforts to cultivate it as secretly as possible, in some lonely spots, and he was at last rewarded for all his trials and labors. When the grapes died, and despair seemed to settle down upon the people, as the vine was their principal dependence, the question was sent forth, "Why not try to convert the abandoned and withered vineyards into cochineal plantations?" A *furor* seemed to seize the people in its favor, as it had already been demonstrated that the cochineal insect propagated rapidly, and the cactus flourished luxuriantly. The deserted vineyards were converted into fields of the cactus plant, and such a profitable investment was never made before in the culture of the soil, even in the palmiest days of wine-growing. An acre of ground set out with the cactus plant, yields about 300 pounds of cochineal, and under the most favorable circumstances 500 pounds, for which the owner receives about $340. The peasant women nurture patches of the cactus around their cottages, and thereby acquire considerable convenient little sums for domestic purposes, as the cochineal is always marketable, and in demand.

The cochineal insect resembles a plump rose-bug when dried. The female parents produce young in very great numbers; the males resemble gnats, are very short-lived, and are few in number in comparison with the females. The latter, when young, are white, but gradually become purple in color, by secreting the fluid derived from the plant—that for which it is so valuable. When filled with this secretion, these insects are shaken off the plants, placed on clean boards, and dried in ovens, which process prepares them for market.

It ought to humble personal human pride when it is considered that its gratification is oftentimes due to very despised sources. Thus the cochineal insect—or bug of the cactus plant—is employed to put the artificial rose on the pale cheek, and the bloom on the new scarlet uniform in which the young soldier takes such pride. At some future day, cochineal may become an object of culture in Florida and Texas, where the cactus and its purple insect abound.

Purifying and Filtering Water.

As the period is now approaching when greater necessity exists for the filtration of water than during the winter season, anything new on the subject deserves attention. We learn by a late number of the London *Engineer* that A. P. Malard, of Paris, has recently secured a patent for the employment of prepared wool-shearings as a superior material for the water to pass through to be filtered. He employs any common filter, such as the portable kind so well known in our cities, which have a perforated false bottom, or a supporting shelf of wire gauze on which the filtering material is laid. The wool-shearings employed by M. Malard are prepared in such a manner as to render them very durable, and not so liable to rot as the fibrous filtering diaphragms commonly employed. He first boils his wool-shearings for one hour in a solution of alum and cream of tartar, then takes them out, and exposes them to the air until they are quite cold. After this he boils them for an hour in a solution of nut-galls and acetate of iron, then in a weak solution of the carbonate of soda, after which they are taken out, washed perfectly clean, dried, and are ready for use by placing them in a stratum on the false bottom of the filter, and allowing the water to percolate through them into the recess below, when it is drawn off clear and limpid for domestic use.

As hard water cannot be employed for washing without wasting considerable soap, a simple method of rendering it soft will be useful to many of our readers. Take about a pint of fresh slacked lime, stir it in a gallon of water, and allow the sediment to settle; pour off the clear water, and bottle it tight for use, because if the air is not excluded, it will absorb carbonic acid from the atmosphere. Half a pint of this lime water is added to a gallon of hard water, stirred, and the whole allowed to settle, after which the clear is filtered through a diaphragm of Canton flannel, and is ready for use, being rendered quite soft. Those who reside in limestone districts, where the wells contain hard water, will find this method of treating it (the water) very useful for washing purposes. If they wish to use this softened water for drinking purposes, a little lemon juice or cider added to it will greatly improve its taste. In the magnesian limestone regions of Ohio, and other places, where the water of the wells, in warm dry weather, is liable to cause cramps and chills when drank, especially to strangers; the method described for treating it will prevent such results. The fresh slacked lime water unites with the carbonic acid of the lime in the hard water, and the whole lime held in solution falls down in the state of fine chalk, leaving the water clear and soft.

The oxalate of ammonia also softens hard water, but it is not so easily managed as the caustic lime. It is made by saturating oxalic acid (a poison) in liquid ammonia, and for this purpose the oxalic acid should be ground fine, and stirred among the ammonia with a glass rod. A quart of the oxalate of ammonia will soften thirty gallons of hard water. It is stirred among the water, the sediment allowed to settle, and the clear filtered. For drinking purposes, this water also requires a little lemon juice or cider to render it pleasant to the taste.

Impure water is oftentimes the cause of disease. The impurities consist either of organic or inorganic substances. It is believed that the foregoing processes are capable of removing both kinds of such impurities.

Inspection of Gas.

We have received a copy of the bill which has been introduced into the New York Assembly by Mr. Dayton, to regulate the manufacture and sale of gas. It provides for two important requisites, viz., the quality of the gas manufactured, and the accurate measurement of the quantity passing through the meter. It also provides for unjust charges for use of meters, connections, &c., commonly made. This is to be accomplished by a Board of Gas Inspection in every city of over 50,000 inhabitants, which is authorized to test the quality of gas manufactured, by a standard of merchantable quality, to be fixed by a Central Board, composed of delegates from each local board; and to examine and affix to each meter its percentage of loss of action, or the amount it fails to deliver of its dial register. If the gas tested comes below the standard adopted, the companies are to make a certain reduction in their bills, as prescribed by the Central Board, for different grades of manufacture; and they are also required to deduct from each meter register whatever per centage of loss of action it may have. These are important provisions for the interests of gas consumers, and, we think, ought to receive the consent of every honorable gas company.

The Submarine Railway.

It is said by European journals that the project of M. Thome de Gamond for connecting England and France by a submarine tunnel is to be thrown aside for a plan much more novel. A vast iron tube is to be constructed which will float in mid ocean, not touching the bottom or yet rising to the surface, through which the railroad is to be laid. It has been calculated it would cost six million pounds sterling, and would have a buoyant power of one hundred and eighty-two thousand tuns.

The Onward March.

So much permanent universal good having resulted from the London, New York, and Paris Exhibitions, it is proposed to hold another at London—a gathering of the nations, each coming laden with the fruits of its industry—in 1861. The first idea was to have an exclusively fine art exposition; but the popular voice, combined with appeals from the press, will throw it open to every article which is the product of human labor, from a wooden nutmeg to Ruben's Crucifixion.

Country Lectures.

In the town of Woodstock, Canada West, the Rev. Mr. Bell gave a lecture on geology, and treated it with special reference to that locality. We notice this fact as being valuable, and were all lecturers in science to follow Mr. Bell's example, and choose their illustrations from spots and doings familiar to their audiences, much more knowledge would be disseminated in a lecture season than is usually the case.

APPRENTICES.—Messrs. W. R. Dunlap & Co., of Cincinnati, Ohio, order fifteen copies of the SCIENTIFIC AMERICAN, which they intend for the use of their apprentices. They inform us that it is their intention in future to pursue this course. This company is engaged in the manufacture of steam engines and boilers, also flouring mills, complete in every department. We venture to express the opinion that they will find the investment which they have made one of the very best, and that their apprentices will be rendered more useful to them accordingly.

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To Prevent Incrustations in Boilers.

MESSRS. EDITORS—Permit me to lay before your readers a process for the prevention of incrustations in the boilers of ocean-going steamships. The incrustations are composed of the carbonates, sulphates and muriates of lime, magnesia, and soda; the two first being the most abundant, contrary to what from an *a priori* view of the composition of sea-water might be anticipated. Any incrustations which I have examined contain but a very minute portion of muriate of soda, which, according to the analysis of Murray and Vogel, constitutes at least four-fifths of the solid ingredients of sea-water, this salt being almost entirely got rid of by the mechanical process of blowing "through," resorted to by engineers for the purpose of keeping their boilers clean. My experiments have been directed to the discovery of a substance which, when introduced into the boiler, would communicate to the *whole* mass of solid matter contained in sea-water, a fluidity equal to that of the muriate of soda, and I think that this is effected by the employment of masses of metallic antimony. These being placed in the boiler, the action of the muriatic acid contained in the sea-water forms muriate of antimony, which imparts to the other salts with which it comes in contact the necessary degree of solvency to permit of the whole mass being got rid of by the ordinary process of "blowing-off" above mentioned. Analogous instances of increased solubility by amalgamation and admixture are common in chemistry. I may cite the well-known fusible metal compound of bismuth, lead and tin, none of which singly melt at a lower heat than 442° Fah., whilst in conjunction they are soluble at a point at or under that of boiling water. I am led to believe that antimony possesses the power of imparting increased solvency to some of the substances with which it comes in contact by a consideration of the properties of the tartrate of antimony and potass (common tartar emetic). Tartrate of potass by itself is so slightly soluble in water as to have led to the employment of tartaric acid as the special test for the detection of the various combinations of potassa, but as it exists in the above-named preparation with antimony we have a salt of familiar solubility. I think it also not unreasonable to suppose that owing to the contact of the antimony with the metal of the boiler, aided by the liberation of the muriatic acid, sufficient electricity may be generated to assist in the prevention of the adhesion of the earthy particles, a view which is substantiated by the discovery of Davy, who found that a piece of zinc the size of a pea inserted into the copper-sheathing of a vessel was fully equal to the preservation of forty or fifty square inches of the latter metal from corrosion.

I have been engaged for some years in experiments bearing on the prevention of incrustations in boilers, and have found that in models the employment of antimony is all-sufficient for the purpose. Soon after its introduction into the boiler, the presence of antimonial salts in the water can be demonstrated by the usual re-agents, and I have found it quite possible to keep a small boiler in which very strong sea water was constantly boiling, evaporating and digesting perfectly clean and lustrous interiorly for an indefinite length of time, without resorting to "blowing through" one tenth part as often as is usual at sea.

I have made no experiments on the large scale with sufficient material to enable one to arrive at any definite conclusion, and I am aware that my experiments are in consequence defective, as several processes for the same purpose which have been apparently correct in theory, and have answered well with the model, have been found worthless when applied to large boilers; but I have been induced to give the results of my researches so far as they have gone, as some of my notes have been stolen, and I am apprehensive of the use which may be made of them. I am also in hopes that the publication of my remarks may lead to a trial which may end in some discovery by which the desired result may be attained. HENRY FISHER, M. D.

121 Bleecker st., New York, March, 1858.

[This is an important communication. It suggests the use of a new substance to prevent incrustations in marine boilers, which, if it answers the purpose, must be far superior to astringent matters which are sometimes employed, as it will not injure the iron like these. In sea steamers, there is no choice of water; they must use the salt brine of "old Ocean." This is so highly charged with depositing saline matter, that a crust of about one-eighth of an inch thick is formed in a boiler during a voyage between New York and Liverpool. As this scale on the inside of the boiler is a non-conductor—in comparison with the metal—it follows that a great waste of fuel is caused by its formation. It also tends to injure the metal of the boiler, especially the flue tubes, and much labor is expended to remove it at the end of every trip. Any simple, cheap, and efficient remedy for these evils is therefore an object of great consequence.

Moonology.

MESSRS. EDITORS—On page 183 of the current volume of the SCIENTIFIC AMERICAN, is an article under the head "Moonology," about which volumes of the most wild speculations might be collected. It is truly astonishing to notice the almost universal prevalence of the superstitious notions with regard to such things. And so long as scientific men encourage such things, by sending forth to the world thousands upon thousands of almanacs, containing different "weather signs," just so long will the mass of mankind be subject to such superstition.

As I have never seen or heard any arguments, except those of a speculative kind, in favor of regarding the moon's phases, as peculiarly favorable to planting, laying fences, spreading manure, and a thousand other *et ceteras*, I must regard the whole as an offspring of superstition and speculative philosophy.

Last spring I planted my potatoes in the "new" of the moon, (the unfavorable time,) but at digging time I had an excellent crop, rather superior to any in the neighborhood, both as to size and number of bushels, according to the quantity of ground. I had first-rate soil, and then tended them well.

Both the sun and moon, undoubtedly, exercise an influence on our atmosphere, through attraction, in the growth of vegetation, and in producing chemical changes which cause *wind*, rain, hail, &c.; but the peculiar position or phase of the moon, with regard to the time of planting only, can have no such influence whatever.

Now, as a matter of curiosity and question, if we put a potato in a cellar which has but one window, and if the cellar be sufficiently warm, the potato will sprout, and the leading vine will run directly towards the window, especially if it (the window) be very small. The vine will run along the floor of the cellar until it reaches a point where a direct ray of light through the window could not reach it; it will then raise its head, and still aim directly for the window, and will continue to grow in that direction, as long as it can support itself. Will some one explain this upon natural principles?

E. PERIN.

Blue Grass, Iowa, March, 1858.

[Animals have certain constitutional qualities which we term *instinct*, and so have plants, although the two are different in their character. What is it, then, but vegetable instinct, which makes the potato vine seek the light in a cellar?—the same law which makes the roots of bushes and trees strike into the soil in the direction of a stream, or where they can obtain moisture, for nourishment. Light is as essential to the life and vigor of a plant as moisture. Many persons suppose that most of the almanacs published are edited by men of science; this is not the case; and those referred to by our correspondent are certainly not the productions of scientific men.—EDS.

Trial of Fire-arms.

MESSRS. EDITORS—On page 214, present volume of the SCIENTIFIC AMERICAN, I find a challenge from Lieut. J. C. Symmes, addressed to all inventors of breech-loading guns. I am ready to accept the challenge, upon the conditions that at least three hundred shots shall be fired without cleaning the guns. This will give a fair test of their accuracy of fire, and at the same time test the working of the machinery. This last test I consider the most important feature in connection with breech-loading fire-arms. GILBERT SMITH.

Buttermilk Falls, N. Y., March, 1858.

[We admit Mr. Smith's card in response to the challenge of Lieut. Symmes, as it is the first one which we have received, and it specifies conditions which are important in judging the utility of this class of fire-arms. Parties who propose to enter upon this contest will in future address their responses to Lieut. Symmes, at the Watertown (Mass.) Arsenal, instead of to us.—EDS.

Feeding Horses.

A correspondent of the *Michigan Farmer* says:—

"The actual amount of food consumed by a horse will depend upon his form and disposition. I have found that horses of a compact form and quiet disposition, weighing 1,200 pounds, and exerting a force equivalent to moving 150 or 200 pounds, at the rate of two miles per hour, for ten hours per day, and six days in the week, will require each twenty pounds of oats, fourteen pounds of hay, and seventy pounds of water, with a comfortable stable, to keep them in good order. Much depends upon the horse having a keeper who knows how to use him without harshness."

[The feeding of horses is an important subject. We have heard farmers and others well acquainted with the noble animal assert that the best feed is a mixture of Indian corn, oats, and barley, cracked in a "corn crusher." The Arabs feed their horses almost exclusively on barley. About four quarts of the above-mixed feed will answer for a meal, with a moderate quantity of hay afterwards.—EDS.

Railroad Management.

The New York State Engineer—Silas Seymour—in his report, dated the 15th ult., imparts some very excellent advice regarding investments, and the management of railroads. He says:—

"Disinterested parties should never be induced to invest in a railroad enterprise without first making an allowance larger than any limit yet ascertained, for exaggerations in the reports of engineers, and statements of other parties, who have either already invested or are to be benefited by its construction."

"The road and outfit should always be of the first-class, and kept in perfect condition."

"The control of the operating department should always be in the hands of men of sound judgment, large experience, and inflexible honesty."

"The true and only reliable source of revenue and profit to railroad companies is the local business naturally pertaining to the country and towns through which the road passes, or at which it terminates. This business should always be encouraged, by doing it upon the most reasonable terms, and to the satisfaction of those who create it."

This is good and much-needed advice, for some of our railroads, in their stupid management, act upon opposite maxims. Instead of encouraging the local business of towns along the lines, especially in passengers, they actually discourage it. Thus the New York and Erie Railroad charge three cents per mile on way trains, running at the rate of thirteen miles per hour, and only two and one-fourth cents per mile on express trains, running at the rate of twenty-five miles per hour. This policy of management is "penny wise and pound foolish."

"The expenses of operating well-managed roads are generally from fifty to sixty per cent of their gross earnings."

"The wear and tear of track and machinery are very nearly in the ratio of the speed of the trains; therefore (within reasonable limits) the slower the speed the less will be the expenses, when considered with reference to the amount of business done."

"The safest and most profitable speed is about twenty miles per hour for passengers, and ten miles for freight trains, and they should never exceed these limits except in cases of emergency."

He complains of the reckless manner in which railroads are managed in reference to high speeds, and advises a reduction of it to a much lower standard. There are 88 railroad corporations in the State; the total length of track (double and single) in operation, is 3,576 miles; the total expenditure in their construction has been $136,689,690.

The foregoing extracts deserve attention. We shall finish with the following one, which deserves to be written in letters of gold:—

"The employés upon a railroad, who have business intercourse with its patrons or the public, should be men of integrity, gentlemanly manners, firm purpose, and unexcitable temper."

Doctors in Beloochistan.

To the practice of medicine in Beloochistan there are only two slight drawbacks. When the physician gives a dose, he is expected to partake of a similar one himself, as a guarantee of his good faith. Should the patient die under his hands, the relatives, though by no means bound to exercise it in all circumstances, have the right of putting him to death, unless a special agreement has been made, freeing him from all responsibility as to the circumstances; while he, should they decide on immolating him, has no reasonable ground for complaint, but is expected to submit to his fate like a man and a hakim. In other respects, the amateur will find an easy field. No diploma or special qualifications are required of him; his ignorance will remain undetected; the ailments are few and simple, and the chances of recovery are great, for the healing power of nature is very strong. —*Blackwood's Magazine.*

Lacepede.

The Count de Lacepede, a great and comparatively unknown naturalist, was born at Agen in 1756. His friend, the great Buffon, obtained for him the post of keeper of the cabinets in the King's garden at Paris, in which position he pursued with many advantages his scientific studies. His writings were voluminous, and among them we may mention his natural history of oviparous quadrupeds and serpents, reptiles, fish, and cetaceous animals. He died in 1825, having lived through the troublesome times of the Revolution as a man of science who was universally respected.

Osage Orange Fences.

The *Southern Planter* says, regarding this plant for live fences, which should be extensively cultivated:—"Beyond all question, we think that the 'osage orange' is better suited for hedges in this country than any and all other plants which have been offered to the public. Its superiority is seen in that it is a native of the country. It is of very rapid growth, and the number and size of its thorns render it a terror to all animals."

Artesian Wells in Illinois.

We learn by the *Prairie Farmer* that the above kind of wells are becoming common in some parts of Illinois, and that they are of the greatest necessity and benefit to farmers residing on prairies distant from living streams. There are about a hundred such wells in Iroquois county alone; their average depth is about one hundred and twenty-five feet, and cost about $200.

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Correspondents

CORRESPONDENTS who expect to receive attention must give their proper names. We always throw away all letters sent to us not accompanied with the writer's name.

J. S. C., of Wis.—Send sketch and description of your improvement, and write to us so that we shall know how to address you by letter.

D. N., of Ill.—You inquire if a person would be infringing a patent, if he should make a machine so patented and use it only for his own family, such as a water filter or a sewing machine? We answer certainly he would. No one has a right to either make or use a patented machine in any manner whatsoever without acquiring a privilege so to do from the owner of the patent.

N. C. Y., of Mass.—You can procure tailor's shears, trimmers and scissors of the very finest quality from Wendt & Seymour, No. 29 Gold street, this city. We have examined their samples, and can recommend them unqualifiedly.

E. W., of Iowa.—There are a number of double seaming machines now in successful use for tin working. You can patent any improvement which you may have made in such machines. If you will send us a sketch and description of your plan we will examine it with pleasure.

H. P. T., of Mass.—We have noticed with much pleasure your success in the discovery of comets. What has become of that monstrous one which was to pay his respects this way sometime last summer, and didn't? If you discover at any future time that he peregrinates towards the Scientific American office, please telegraph us, so that we may stand from under.

J. C. C., of Conn.—We suppose every needed alteration in your case has been made, and that the letters patent will be issued at any time you may order. Your inquiry is very blindly put, and it may be that we have failed to understand you, and knowing nothing of the particulars of your case, we may have misapprehended what you are driving at.

A. R. McL., of N. Y.—Violin strings are prepared from twisted intestines of sheep, which is cleaned and twisted while wet, and then dried in a proper frame. The best are made in Milan, and are sold under the name of Roman strings.

J. F. K., of Ohio.—You state that you have been informed that a patent cannot be sold on a writ of execution, and wish to know if this is the law? A patent, like other property, passes to assignees in cases of bankruptcy. Curtis says on pages 225-6:—"The interest in a patent may be assigned by operation of law, in case of the bankruptcy of the patentee."

A. H., of Mass.—The hydrate of alumina is not a fluid, but a gelatinous mass, and it is prepared by M. Meul by making a solution of common alum, and adding to it a solution of carbonate of soda until a gelatinous mass is formed. This precipitate is then washed with pure water on the filter, and you have the desired compound. Its formula is Al 2. O 3. ⋈3 HO.

B. F. McC., of Ga.—The common method of silver-plating articles now practised is by the electrotype process, and requires much practice to perform it skillfully. If you purchase "Smee's Electro-Metallurgy," it will give you the information desired. This work is published by Wiley & Halsted, Broadway, this city. A recipe could not furnish you with all the desired knowledge. W. H. Chester, 104 Center street, this city, furnishes electrotyping apparatus.

R. R., of Kansas.—Your discovery that lead loses its weight when immersed in quicksilver is old, and we have no doubt that the model you made operated, but there is this objection that your leaden wheel would be so quickly dissolved or amalgamated by the mercury that after a few turns there would be no wheel at all.

W. H. W., of Ind.—You ask us to answer a question to which you have already received a reply, and that reply is quite correct, as you state the question to us.

P. G. R., of Va.—We do not know of any printing press that would answer your purpose, neither can we inform you of the cost of cutting brass cog wheels. We do not know where you can obtain such information. We think we can use our columns to better advantage than to publish "perpetual motions."

G. W. S., of Ohio.—We received your letter regarding the re-pointing of gold pens, but thought you were mistaken. We have had demonstrative evidence of the successful re-pointing at a moderate cost of such pens.

Thos. M. Scott, of La. Grange, Ga., wishes to correspond with some one who will undertake to manufacture his patent fly trap upon reasonable terms.

L. S. P., of Texas.—J. W. Nystrom, of Philadelphia, is the inventor of a neat calculating machine, but it is not of the capacity of Babbage's to which you refer. We are not aware of its price. We are unacquainted with the French calculating machine which you mention.

J. de Y., of Texas.—The work on engineering to which you refer, containing information on cements, must be "Mahan's Civil Engineering." It is published by Wiley & Halsted, this city. We are not acquainted with any other.

E. S. W., of Ind.—The best work on gasmaking and the various allied processes is Ronalds and Richardson's Technology, vol I., part 2. It can be obtained of H. Bailliere, 298 Broadway, New York.

F. W. S., of N. Y.—A patented machine bought by you, without any reservation as to its use, by the person who has the legal power of sale, can be loaned or hired by you to accomodate any of your neighbors. Were the law otherwise in its spirit, the farmer or manufacturer who purchased patented implements, would be obliged to work them all himself—a preposterous idea.

J. B., of Md.—You ask: "How many revolutions per minute must a burr stone of 4½ feet perform, to require the same power only of a 4 feet stone, running 150 revolutions per minute, each grinding the same quantity of wheat in the same time?" We cannot answer this question according as it is put, because it is not a fair one. It will require the same power to give the 4½ feet stones 136 revolutions per minute as the 4 feet stones, making 150 revolutions; but the larger stones will not grind the same quantity of wheat as the small ones, because, although they have as great a circumferential velocity, yet they have not an equal central velocity. To grind the same quantity of wheat in the same time, the 4½ feet stones should require to revolve about as often as the 4 feet stones, at least it appears so to us.

E. M. Q., of Mass.—The substitution of malleableiron for wrought iron, in axes and chisels, would allow of their being manufactured at less cost for material, but their quality would be very inferior.

A. F. O., of N. Y.—The best cement known to us to resist the action of alcohol, is composed of melted glue, into which some ground chalk is stirred.

B. F. B., of Pa.—You can color tobacco any shade darker than its natural color, with logwood; you must proportion the strength of the logwood liquor to the depth of shade required. The common machines for cutting tobacco are not working under a patent, they are public property.

R. S. P., of Pa.—Optical glasses are first ground with fine emery to the exact form on proper tools, and afterwards polished with fine *rouge* powder.

W. B. G., of Ohio.—Printing ink can be taken out of paper by caustic soda; but this alkali renders the paper yellow in color.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, March 27, 1858:—

A. T. R., of N. Y., $25; L. P., of Me., $20; H. M., of N. Y., $25; F. D. L., of S. C., $105; E. V. S., of Miss., $55; C. & W., of Pa., $30; H. D., of Pa., $25; L. R., of Ill., $25; C. B. B., of Ill., $10; J. B., of Ind., $30; A. B. J. F., of Ind., $30; R. G. S., of Ill., $30; E. C., of Mass., $250; S. W. W., of N. Y., $30; G. V. G., of O., $20; G. I. C., of Ill., $15; B. F. S., of Pa., $30; E. B. W., of N. C., $50; G. Y., of N. Y., $10; K. F., of Wis., $30; J. C. S., of Mass., $30; R. H. F., of N. H., $80; O. T. W., of Pa., $30; S. R. H., of N. Y., $150; W. R. L., of Conn., $35; Z. N. M., of Texas, $30; T. J. B., of Ohio, $30; J. W. G., of Vt., $5; M. G. F., of N. Y., $55; J. L. R., of Iowa, $30; T. K. W., of Conn., $25; J. T., of Mass., $30; C. L. C., of Ill., $30; R. & S., of Ohio, $30; J. W. H., of R. I., $57; N. F. E., of Vt., $20; W. DeG., of N. Y., $25; L. & G., of Conn., $30; P. B., of Ill., $25; W. W., of N. Y., $30; B. J., of L. I., $25; J. McN., of L. I., $35; J. W. C., of N. Y., $25; J. H. W., of N. Y., $12; J. B., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 27, 1858:—

I. C., of Vt.; J. W. G., of Vt.; B. J., of L. I.; W. R. L., of Conn.; R. H. F., of N. H., (2 cases); J. McN., of L. I.; J. H. W., of N. Y. G. V. G., of Ohio; J. W. C., of N. Y.; J. B., of N. Y.; D. & M., of Pa.; L. R., of Ill.; H. M., of N. Y.; A. T. R., of N. Y.; W. H. L., of Pa.; T. K. W., of Conn.: W. DeG., of N. Y.; N. F. E., of Vt.; P. B., of Ill.; W. W., of N. Y.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of twelve years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office, 128 Fulton street, New York. We have lately established a Branch Agency on the corner of F. and Seventh streets, Washington (opposite the United States Patent Office). This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

Communications and remittances should be addressed to MUNN & COMPANY,
No. 128 Fulton street, New York.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly, CHAS. MASON.

THE LITTLE BRICK MAKER TAKES the rough clay, previously one night in soak, tempers and molds 4,000 bricks a day, driven by one man, or horse, and attended by one man and four boys; the brick is beautiful. Thus every farmer can be his own brick-maker, as it requires only common laborers. Price $70; if the molds are 12 x 6 x 3, price $85. The larger machines worked by one horse, making 7,000 per day, $150; by two horses, 14,000, $200; by steam, 25,000 $400. For further particulars, in a pamphlet giving full instructions on brick-setting and burning, address FRANCIS H. SMITH, Sun Building, Baltimore, Md.

SOMETHING USEFUL FOR MACHINISTS and Operatives of Machinery.—Simmon's Decimal Chart, for finding the size of wheels and pulleys for any required number of revolutions per minute—a great saving of time and lengthy calculations. Sent free for one dollar. D. G. SIMMONS,
346 West 27th street, New York.

NEW SAW-GUMMING MACHINE, FOR Re-toothing Circular and Mill Saws, &c.—This machine, as represented in our catalogue, is entirely of wrought and cast iron; it is of sufficient power to re-tooth with ease the thickest and largest saw made. Our catalogue gives a further description, and will be forwarded on application. R. HOE & CO.,
29 and 31 Gold st., New York.

WATER WHEELS! WATER WHEELS! The subscribers, having purchased the right of the improved Jonval Turbine Water Wheel for the States of Virginia and North Carolina, are manufacturing those wheels a reduced prices, which will bring them within the means of all owners of water power, and will warrant them to give a greater percentage of power than any other wheel before the public. These wheels are well adapted to all kinds of mills and factories, also to very low and very high heads and falls, and will work well in back-water without any material loss of power. The subscribers are also manufacturers of the wheel for other States. HEATH & STEVENSON,
Laurel Factory, Md.

CORLISS' PATENT STEAM ENGINES—About 250, most of them from 40 to 400 horse power, are now in operation. On application, pamphlets will be sent (by mail), containing statements of responsible manufacturing companies where these engines have been furnished, for the saving of fuel, in periods varying from 2½ to 5 years. Boilers, shafting, and gearing.
CORLISS STEAM ENGINE CO.,
Providence, R. I.

ORDERS SOLICITED FROM ANY PART of the United States for the building and superintending the construction of flour and saw mills of the most approved kind; also for the selection of the best water wheels and mill machinery in general now in use. OLIVER J. BOLLINGER, Millwright,
Cross Roads, York county, Pa.

TO MACHINISTS—NOTICE IS HEREBY given that I have purchased of Wm. P. Wood and Saml. DeVaughan the entire right of their Scroll, or or Jig Saw and Sawing Machines, as secured to them by Letters Patent and assignments and re-issues, referred to in the deeds of assignments of the 4th inst., and recorded in the Patent Office.

All persons wishing to purchase machines and rights will please address the undersigned, assignee of Wm. P. Wood and Saml. DeVaughan, and he will give all needed information on the subject.
SAMUEL DEVAUGHAN,
Washington, D. C., March 10, 1858.

CHURCH AND REGULATOR CLOCKS, models, engravers' ruling machines that work themselves, and light work done at low prices, at J. STOKELL'S Clock Factory, No. 26 Platt street, New York.

MACHINISTS' TOOLS—A FULL SUPPLY OF every variety, and superior quality, now on hand, and made to order at short notice. Also one 8-horse upright engine, in complete order; price $300.
CARPENTER & PLASS,
No. 479 First ave., New York.

PICKPOCKETS DEFEATED—YOUR WALLET secured to your pocket by convenient Patent Locks, which are outselling everything before offered the public. Agents wanted. Send stamp to DICKINSON & BATE, Hudson, Mich.

FOR SALE—I WILL SELL FOR $5,000 A PATENT right that is worth $50,000. For information address FRANCIS D. HAYWARD, Malden, Mass.

THE WORKS OF THE AUBIN GAS CO., (General Office, No. 44 State st., Albany, N. Y.,) as now perfected, are adapted to all materials and localities, and are in successful operation in villages, factories, and private dwellings. For full information as to cost, probable income of public works, &c., apply as above. For plans, &c., see SCIENTIFIC AMERICAN of March 13th.

STEAM WHISTLES—IMPROVED PATterns manufactured by HAYDEN, SANDERS & CO., 306 Pearl street, New York.

THE SUBSCRIBERS ARE PREPARED TO furnish Plans, Specifications and Estimates for Water-works, or to contract for the introducing of water into cities or towns. J. & S. PARHAM,
Engineers and Contractors,
Philadelphia, Pa.

ANOTHER WONDER—BALDWIN'S TURbine Water Wheel (represented in No. 51, Volume XII, SCI. AM.,) gives from 75 to 97 per cent of power, according to the size of wheel and head employed. Usual sizes, with 4 to 25 feet fall, give 80 to 90 per cent. For information address S. K. BALDWIN, Laconia, N. H.

5000 AGENTS WANTED—TO SELL FOUR new inventions. Agents have made $25,000 on one—better than all other similar agencies together. I give away what fourteen other agencies sell. Only send address and get eighty pages of particulars, gratis.
EPHRAIM BROWN, Lowell, Mass.

FOR SALE—THE PATENT RIGHT OF LAMSON'S Combined Tool, an engraving of which appeared in No. 26, Vol. XIII, of the SCIENTIFIC AMERICAN. Apply to the patentee, New Worcester, Mass.

J. A. FAY & CO., WORCESTER, MASS., build the best Planer and Matcher in use, with wrought iron cylinder and Fitt's patent feed works. Ask all machinery agents for Fay & Co.'s "Bay State Planer," or address as above.

A GREAT CHANCE—THE SUBSCRIBER offers for sale at a bargain the patent for his Self-acting Gate for the whole United States, for cash, or exchange for unencumbered property. This is a great chance to make money. See SCIENTIFIC AMERICAN, No. 29, for illustration. Address C. A. HOWARD, Pontaic, Mich.

SAMUEL McELROY, CIVIL ENGINEER—Late U. S. Naval and Civil Engineer. Special attention paid to water-works with pumping power. Address "Engineer's Office," Water-works, Brooklyn, Long Island.

NOTICE.—ALL PERSONS ARE HEREBY warned not to purchase of F. V. Vannest, or any other traveling agent, rights of R. E. Schroeder's patent for improved Lime Kilns, as no agents have been employed for more than a year to dispose of said rights. My patent is the first and original one for perpetual draw kilns; it is used by hundreds of the most experienced lime-manufacturers, and pronounced by them far superior to any ever in existence. Persons purposing to purchase territory will please address RICHARD E. SCHROEDER, Rochester, N. Y.

GOLD PENS REPOINTED EQUAL TO NEW—Price 25 cents by mail, with return postage. Address L. H. MARTIN, 253 West 25th st., New York.

PORTABLE STEAM ENGINES.—S. C. HILLS, 12 Platt street, New York, offers for sale these Engines, with Boilers, Pumps, Heaters, etc., all complete, suitable for printers, carpenters, farmers, planters, &c. A 2½ horse can be seen in store; it occupies a space 5 by 3 feet; weight, 1,500 lbs.; price $240. Other sizes in proportion.

E. FORBES, ARTIST, 89 NASSAU STREET, New York, Mechanical and General Draughtsman on Wood, Stone, &c.

STEAM ENGINES, STEAM BOILERS, Steam Pumps, Saw and Grist Mills, Marble Mills, Rice Mills, Quartz Mills for gold quartz, Sugar Mills, Water Wheels, Shafting and Pulleys. The largest assortment of the above in the country, kept constantly on hand by WM. BURDON, 102 Front street, Brooklyn, N. Y.

HARRISON'S 30 INCH GRAIN MILLS—Latest Patent.—A supply constantly on hand. Price $200. Address New Haven Manufacturing Co., New Haven, Conn.

TO CONSUMERS OF ALUM—POCHIN'S Pdtent Aluminous Cake, as a substitute for alum, is rapidly taking the place of alum, both in England and this country. The price per pound is about the same as alum, while the cake is 25 per cent stronger. Circulars with full particulars can be had on application to J. B. SHEFFIELD & CO., Sole Agents for the United States and Canada, 63 and 65 Beekman st., New York.

WOODWORTH PLANERS—IRON FRAMES, to plane 18 to 24 inches wide—at $90 to $110. For sale by S. C. HILLS, 12 Platt street, New York.

ALCOTT'S CONCENTRIC LATHE—THIS Lathe is capable of turning under 2 inches in diameter with only the trouble of changing the dies and patterns to the size wanted. It will turn smooth over swells or depressions of ¾ to the inch, and works as smoothly as on a straight line, and does excellent work. Price $25, (without frames,) boxed, and shipped with directions for setting up. For sale by MUNN & CO., 128 Fulton street, New York City.

SECOND-HAND MACHINISTS' TOOLS—Consisting of 20 Engine Lathes, 9 Iron Planers, 4 Upright Drills, Hand Lathes, Chuck Lathe, Gear Cutters and Vices, all in good order, and for sale low for cash. For particulars, address FRANKLIN SKINNER, 14 Whitney avenue, New Haven, Conn.

MACHINE BELTING, STEAM PACKING, ENGINE HOSE.—The superiority of these articles, manufactured of vulcanized rubber, is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise, at our warehouse. NEW YORK BELTING AND PACKING COMPANY. JOHN H. CHEEVER, Treasurer, No. 6 Dey street, New York.

NEW HAVEN MANUFACTURING CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address "New Haven Manufacturing Co., New Haven, Conn."

ENGRAVING ON WOOD AND MECHANICAL DRAWING, by RICHARD TEN EYCK, Jr., 128 Fulton street, New York, Engraver to the Scientific American.

WOODWORTH PLANING MACHINES.—Having over $40,000 worth now completed, I will sell, from this time henceforth, at a very reduced price, and am ready to construct any sizes not on hand at short notice. JOHN H. LESTER,
57 Pearl st., Brooklyn, Long Island.

LAP-WELDED IRON BOILER TUBES—Prosser's Patent.—Every article necessary to drill the tube-plates and set the tubes in the best manner.
THOS. PROSSER & SON, 28 Platt st., New York.

SAWS.—HOE & CO.'S PATENT GROUND SAWS Plastering Trowels, &c., can be had, whole sale and retail, at the principal hardware stores, at the salesrooms of the manufacturers, 29 and 31 Gold street, or at the works corner of Broome, Sheriff and Columbia sts., New York. Illustrated catalogues, containing prices and information interesting to sawyers generally, will be sent by post on application.

WELCH & GRIFFITHS—ESTABLISHED 1836—Manufacturers of Improved Patent Ground and Warranted Extra Fine Cast Steel Saws, of the various kinds now in use in the different sections of the United States and the Canadas, and consisting of the celebrated Circular Saw, Graduated Cross Cut and Tenon, Gang, Mill, Pit, Segment, Billet and Felloe Saws, &c., &c. For sale at their warehouse, No. 48 Congress street, Boston, Mass.

OIL! OIL! OIL!—FOR RAILROADS, STEAMERS, and for machinery and burning. Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer, F. S. PEASE, 61 Main st., Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe.

VAIL'S SPEEDWELL IRON WORKS, Morristown, N. J., manufacture Craig's Patent Double-acting Balance Valve Oscillating Steam Engines both stationary and portable, Knowles' Patent Muley, Portable, Gang and Re-sawing Mills, Sugar and Chinese Cane Mills and Sugar Pans, Grist Mills, Mill Irons, Rich's Water-wheels, Forgings and Castings. Orders for the above, and all descriptions of labor-saving machinery will receive prompt attention.
JOHN H. LIDGERWOOD & CO.,
No. 9 Gold street, New York.

SWISS DRAWING INSTRUMENTS—A full stock of these celebrated instruments always on hand. Catalogue, 4th edition, with 250 illustrations of Mathematical, Optical and Philosophical instruments, and attachment of illustrated sheet representing the Swiss instruments in the actual size and shape, will be delivered, on application, to all parts of the United States, by sending 12 cents in postage stamps. Address C. T. AMSLER, 635 Chestnut st., Philadelphia, Pa.

WOODWORTH IMPROVED—TWO GOLD Medals have been awarded to me for my patented improvements upon the celebrated Woodworth Planing Machine. The above awards, and the large number of these machines now in operation, fully demonstrate their great superiority over all others. Machines of all sizes constantly for sale.
JAMES A. WOODBURY,
69 Sudbury st., Boston, Mass.

RIGHTS FOR SALE of a PATENT LIME-KILN which will burn less wood or coal, and more lime, than any other in use. Address A. G. ANDERSON, Quincy, Illinois.

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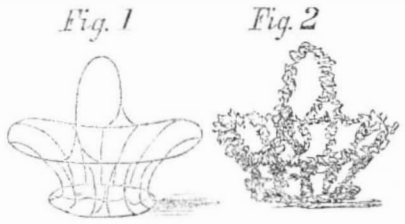
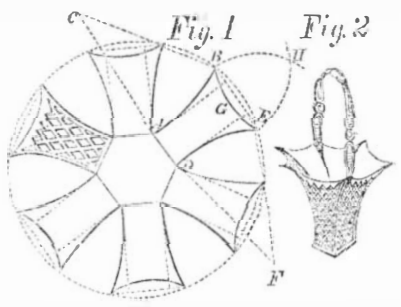
Of late we have been almost too scientific we are afraid, and so to redeem our character with our juvenile friends, we will tell them how to make some very pretty ornaments, and which involve a little science too. There is, as everybody knows, a substance called alum which is beautifully crystalline, and always is seen shaped like double pyramids. This is a compound of an earth, *alumina*, and an acid, *sulphuric*; it is, in fact, the sulphate of alumina, and is put to many useful purposes. This substance is soluble in hot water, and in cooling, it crystallizes out on to anything that



may be in the liquid, and the crystals will take any color, thus indigo will color them blue, cochineal red, and so on. Now, bearing these facts in mind, take a quantity, say a pound of alum, and dissolve it in as little hot water as possible. Then having made a basket of wire, like Fig. 1, immerse it in the hot solution, and put it quietly away to cool. Next morning you can take the basket out, and it looks like Fig. 2, all the wires being covered with beautiful crystals.

Should your first basket have given you some pleasure, here are directions to cut a nice one out of cardboard, one like that shown in the engraving, Fig. 2. Take your cardboard and draw one circle in the center, and then a larger, just the distance apart you want the sides to be high. Then on these circles construct the hexagons that form the base and



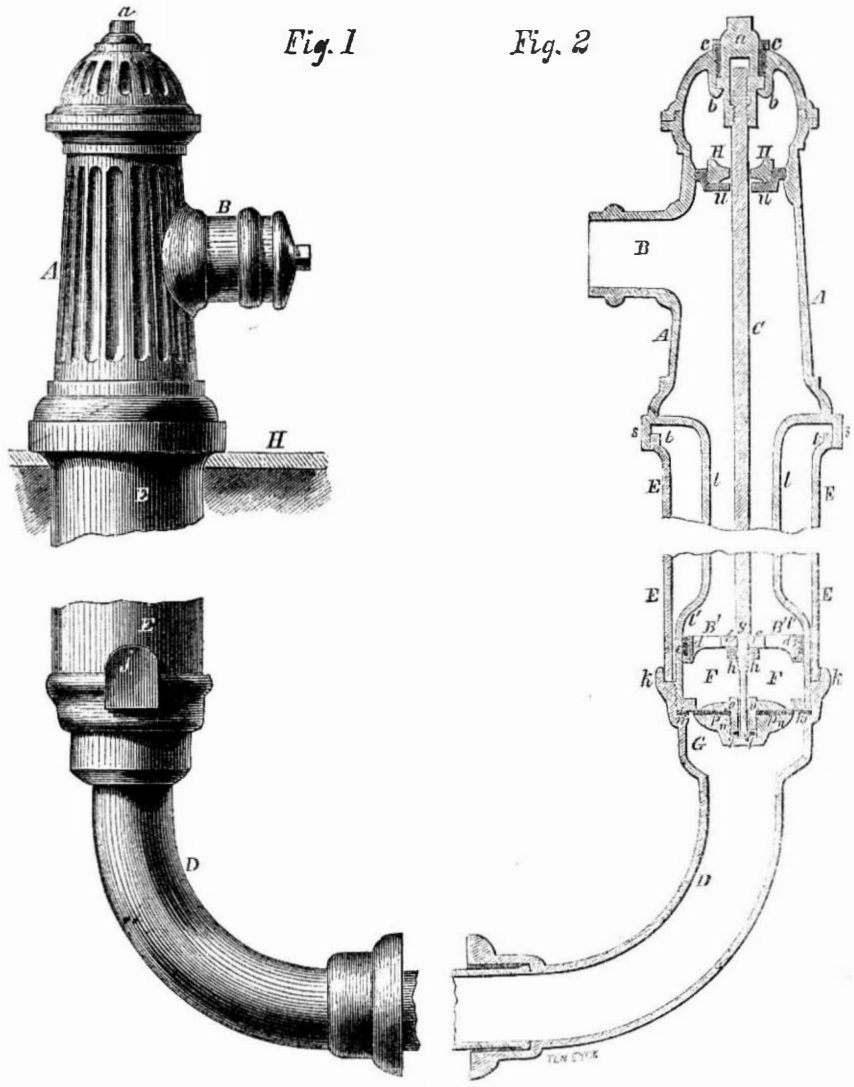
rim of your basket. Place the point of the compasses in A, and afterwards in B, and draw with the pencil point two arcs which intersect each other at C; this done place the compass point at C, then describe the arc, A, B, which will give the necessary curve to the side and then from the points, D E, draw arcs intersecting at F. From this point you obtain the side, D E, then from the points, B E, describe the arcs, B H, and E H, and from H you get the curve, G, for the top; having done this with each side, on folding them up, they will form a very pretty basket, and any devices that suit the maker's fancy may be drawn or painted on the sides.

House-Heating Apparatus.

We recently (on page 213) expressed opinions relative to the best mode of heating buildings, and good hot water furnaces were favorably noticed. This subject is justly exciting considerable attention at present, and we have received several letters referring to it. One from Thomas T. Tasker, Sr., states that his hot water apparatus, described on page 148, Vol. X, Scientific American, has been successfully and extensively introduced into Philadelphia, and will soon be in use in this city. Another from a correspondent in Lockport, N. Y., advocates hot air furnaces, and instances the benefits which its author and several others have derived from their use. At some future period we may present extracts from it, as it endorses very fully our views regarding ventilation. We have also examined "Brown's Hot Water Heater," at No. 22 Spruce street, this city, since the article referred to was published, and will probably soon be able to illustrate it in our columns.

On page 213 reference is made to the illustrated furnace on page 51, Vol. XI, Scientific American; it should have been page 401, No. 51.

RACE & MATTHEWS' HYDRANT.



The chief features of novelty in this hydrant are that, by the peculiar arrangement of the valve, the waste pipe is opened as the induction pipe is closed, and it can be readily removed from its base without the necessity of excavating.

The engravings illustrate a perspective (Fig 1) and sectional (Fig. 2) view of the hydrant. A is the case, the upper part of which can be of any appropriate ornamental form provided with one or more horizontal nozzles, B. The lower part of the case, *l*, is smaller in diameter than the upper, and is cylindrical; this part is below the surface of the ground. The lower part of *l* is widened out at *l'*, and an annular valve, B', is fitted into it. This valve is formed of a flat ring, *d*, grooved on its surface to receive a packing, *e*, of leather or other suitable material. The ring, *d*, has a crossbar, *f*, having a hub or boss through which the rod, C, is fitted; this rod, C, has a shoulder *g* upon it, that serves as a bearing to the upper side of the boss. A nut, *h*, on C, under the boss, firmly secures B' to the rod. A screw passes through *d* at a point directly opposite the waste opening in *l*. The lower end of *l'* has a screw thread formed upon it, and it is screwed into the head of the bent pipe, D, that communicates with the "main," and is permanently secured in the ground. An annular piece of packing, *m*, is interposed between *l'* and D. An annular valve seat, F, is also screwed into the lower part of *l'*. G is a valve formed of two parts, *n* and *o*; the part *n* is of cup form, and contains a nut, *g*, by which G is secured to C. The other part of the valve, *o*, is a cap that is screwed down upon a packing, *p*, which, when the valve is closed, bears against the seat, F. The valve, G, can turn freely on C. Around the outer side of *l'* a groove is made in the same plane as the lip of the waste opening, *j* in *k*. A and E are attached to each other by means of flanches, *s* and *t*. In the upper part of A, a cap, H, is screwed, and secured into a recess, *u*, in which a packing is placed, thus forming a stuffing box. The upper part of rod, C, has a screw thread worked on it, and this screws into a cap, *a*, that rests by a flanch on *b*, and is held secure by a nut, *c*. A wrench applied to *a* will operate G, and by moving it one and a half inches, the full capacity of the hydrant is let on. The top, *a*, is made so as to require a peculiar wrench, thus forming a key.

The operation is as follows:—By applying the wrench to *a*, the rod, C, can be raised or lowered. When it is raised, the valve, G, bears against its seat, F, and water from the "main" cannot pass into the case, A, of the hydrant. When the valve, G, is closed, the valve, B', is above the opening, *j*, and therefore any water in the case can pass out. When the rod, C, is lowered, the valve, G, is opened, and the valve, B', closes the opening, *j*, while the water from the "main" passes up through it into case, A, and through the nozzle, B. In case any of the parts require to be repaired, the whole hydrant may be raised, the jacket, E, remaining stationary; this is done by turning the case, A, which unscrews *l* and *l'* from *k*.

This excellent hydrant is the invention of Washington Race and S. R. C. Matthews, of Seneca Falls, N. Y., and it was patented January 28, 1858. Further information may be obtained by addressing Messrs. Race & Matthews, as above.

At the "galvanized iron works" of Messrs. McCullough & Co., Prime st., Philadelphia, Pa., two large storehouses of corrugated galvanized sheet iron are being constructed for firms in the island of Cuba.

Literary Notices.

The Application of Art to Manufactures, with 180 Illustrations. By George C. Mason. New York: G. P. Putnam & Co. 12mo., $1 50. The object of this work has been to collect the historical facts relative to metal working and the manufacture of textile products, together with such particulars of the various processes of converting the raw material into finished goods, as are most likely to prove interesting and attract attention to the importance of a higher development of art in our manufactures. The author has performed his work well, and his book is replete with suggestions and illustrations which will prove of infinite service to those engaged in the branches of manufacturing treated of. The tendency of American ingenuity and skill is toward utilitarianism almost exclusively, leaving art to take care of itself; but, in nine cases out of ten, a product may be rendered pleasing and attractive to the eye and the mind, at the same time it is rendered useful, without additional cost, by simply observing the acknowledged rules of art, therefore we welcome this volume to our list of practical mechanical works, and cordially recommend it to our readers.

Sorgho and Imfee.—A. O. Moore. No. 140 Fulton st., this city, has just published Henry S. Olcott's excellent little work, with supplement, on the above plants, embracing a full account of the successful experiments of Mr. Lovering, of Philadelphia, in making Sorgho sugar, which have been alluded to by us in a previous number. Very extensive experiments will undoubtedly be made this year in the cultivation of the above plants to test their capacity and economy as sugar producers.

Imperial Cyclopædia of Machinery.—Parts 13, 14, 15, and 16 of the above well-named work have just been issued by Messrs. C. B. Russell & Bros., Tremont street, Boston. It is edited by Wm. Johnson, of Glasgow. No. 13 contains large working drawings of direct acting engines, by Jas. Watt & Co., of Soho, London, fitted in the large ship of war, *James Watt*. No. 14 contains an engraving of an improved throstle spinning frame, by Messrs. Sharp & Roberts, the renowned manufacturers of cotton machinery in Manchester, England. No. 15 contains engravings of the engines of the *La Plata*, the West India mail steamer, by Robert Napier. No. 16 contains engravings of an expansion double cylinder engine; also, a huge cotton warp sizing machine.

The Atlantic Monthly.—This vigorous young magazine for April contains fourteen able articles. The leader is on "The Hundred Days," by an eye witness, from the time Napoleon arrived in Paris, from Elba, until his sun went down on the Field of Waterloo. It is full of thrilling incident. Published by Phillips, Sampson & Co., Boston.

Blackwood's Magazine.—The number of this old and favorite magazine for March has been promptly republished by Messrs. L. Scott & Co., No. 54 Gold st., this city. "What will he do with it?" by Bulwer, is continued, and so is Capt. Burton's journal of his interesting travels in Zanzibar. The other articles are all good, and worthy of Blackwood in its palmiest days.

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